INDEPENDENT ORBITER ASSESSMENT

ANALYSIS
OF THE
REACTION CONTROL
SYSTEM
Vol. 3 of 3

19 JANUARY 1987

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1607

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-19; J2-94

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX TK ISOL 3/4/5 A VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1608 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-19; J2-94

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1609

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-38; J2-26

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU TK ISOL 3/4/5 A VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE VALVE POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1610 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-38; J2-26

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1611

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-91; J2-98

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX TK ISOL 3/4/5 A VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1612 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-91; J2-98

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1613

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-10; J2-93

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1614 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-10; J2-93

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1615 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-9; J2-76

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1616 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-9; J2-76

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1617 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-92; J2-16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU TK ISOL 3/4/5 A VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1618

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-92; J2-16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO THE GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1619 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-20; J2-86

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU TK ISOL 3/4/5 A VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1620 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-20; J2-86

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO THE GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1621 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-59; J2-27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU TK ISOL 3/4/5 A VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE VALVE POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION..

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1622 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J2-59; J2-27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1623 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-89; J2-27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX TK ISOL 3/4/5 B VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1624 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-89; J2-27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1625 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-76; J1-62

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU TK ISOL 3/4/5 B VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 3/4/5 B SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE VALVE POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1626

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-76; J1-62

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1627 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-91; J2-42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX TK ISOL 3/4/5 B VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1628

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-91; J2-42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1629 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-95; J2-19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS TK ISOL 3/4/5 B SWITCH" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1630

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-95; J2-19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1631 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-92; J2-18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS TK ISOL 3/4/5 B SWITCH" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1632 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-92; J2-18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1633 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-90; J2-26

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU TK ISOL 3/4/5 B VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1634 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-90; J2-26

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO THE GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1635 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-81; J2-28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU TK ISOL 3/4/5 B VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1636

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-81; J2-28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO THE GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1637 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-86; J1-49

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU TK ISOL 3/4/5 B VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS TK ISOL 3/4/5 A SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE VALVE POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION..

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1638 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 B
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115R J2-86; J1-49

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1639 ABORT: 3/3

ITEM: RESISTOR, 12K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 12K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-118; A1R19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "OX XFEED 1/2 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1640

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 12K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 12K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-118; A1R19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "OX XFEED 1/2 VALVE" IN OPENED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1641 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-118;; A1R8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "OX XFEED 1/2 VALVE" IN OPENED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1642

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-118;; A1R8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "OX XFEED 1/2 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1643 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-75; A3R6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU XFEED 1/2 VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS XFEED 1/2 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE THE TWO "OX ISOL VALVE" POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1644

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-75; A3R6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1645 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-55; A3R4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX XFEED 1/2 VALVE" MOTORS WHEN VALVE REACHES OPEN POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS XFEED 1/2 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC OPEN OR CLOSE VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1646 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-55; A3R4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1647 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-56;; A2R13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS XFEED 1/2 SWITCH" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1648

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-56;; A2R13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1649 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-65; A3R5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "FU XFEED 1/2 VALVE" MOTORS WHEN VALVE REACHES OPEN POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS XFEED 1/2 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC OPEN VALVE COMMANDS END.
PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1650

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-65; A3R5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1651 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-31; J5-41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS XFEED 1/2 SWITCH" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1652 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-31; J5-41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECTS. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1653 ABORT: 3/3

ITEM: RESISTOR, 12K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 12K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-81; J3-44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "FU XFEED 1/2 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1654

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-81; J3-44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "FU XFEED 1/2 VALVE" IN OPENED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1655 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-81; J3-44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "FU XFEED 1/2 VALVE" IN OPENED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1656

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-81; J3-44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "FU XFEED 1/2 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1657 ABORT: 3/3

ITEM: RESISTOR, 12K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 12K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J6-1; A1R20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "OX XFEED 3/4/5 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1658

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 12K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 12K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J6-1; A1R20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "OX XFEED 3/4/5 VALVE" IN OPENED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1659 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J6-1;; J3-89

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "OX XFEED 3/4/5 VALVE" IN OPENED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1660

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J6-1;; J3-89

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "OX XFEED 3/4/5 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1661 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J3-85; A3R8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU XFEED 3/4/5 VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS XFEED 3/4/5 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE THE TWO "OX ISOL VALVE" POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1662 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J3-85; A3R8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1663

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J3-56; A3R9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX XFEED 3/4/5 VALVE" MOTORS WHEN VALVE REACHES OPEN POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS XFEED 3/4/5 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC OPEN OR CLOSE VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1664 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J3-56; A3R9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1665 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J6-60; J2-79

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS XFEED 3/4/5 SWITCH" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1666 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J6-60; J2-79

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1667 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J3-77; A3R10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "FU XFEED 3/4/5 VALVE" MOTORS WHEN VALVE REACHES OPEN POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS XFEED 3/4/5 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC OPEN VALVE COMMANDS END.
PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1668

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J3-77; A3R10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1669 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J6-59;; J2-78

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS XFEED 3/4/5 SWITCH" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1670

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J6-59;; J2-78

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECTS. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1671 ABORT: 3/3

ITEM: RESISTOR, 12K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 12K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J6-2; A1R19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "FU XFEED 3/4/5 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1672

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 12K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 12K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114 J6-2; A1R19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "FU XFEED 3/4/5 VALVE" IN OPENED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1673 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J6-2; J3-88

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "FU XFEED 3/4/5 VALVE" IN OPENED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1674

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 54V76A114R J6-2; J3-88

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "FU XFEED 3/4/5 VALVE" IN OPEN POSITION. LOSE VOLTAGE DIVISION TO MDM FA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1675 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-31; J1-76

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS MANIF ISOL 1 SWITCH" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1676 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-31; J1-76

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1677 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-32; J1-88

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS MANIF 1 ISOL SWITCH" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1678 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-32; J1-88

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1679 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-21; J1-75

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU MANIF 1 ISOL VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1680

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-21; J1-75

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1681 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-12; J1-73

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU MANIF 1 ISOL VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1682

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-12; J1-73

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1683 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 55V76A115 J1-68; J1-65

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU MANIF 1 ISOL VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS MANIF ISOL 1 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE VALVE POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1684

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, MCA 1
PART NUMBER: 55V76A115 J1-68; J1-65

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1685 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-22; J1-74

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIF 1 ISOL VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1686

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-22; J1-74

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1687 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-13; J1-72

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIF 1 ISOL VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1688 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 55V76A115 J1-13; J1-72

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1689 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-24; J2-8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS MANIF ISOL 2 SWITCH" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1690

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-24; J2-8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1691 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-45; J2-35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS MANIF 2 ISOL SWITCH" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1692 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-45; J2-35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1693 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-3; J2-60

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU MANIF 2 ISOL VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1694 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-3; J2-60

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1695 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-2; J2-95

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU MANIF 2 ISOL VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1696 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-2; J2-95

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1697 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-30; J2-53

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU MANIF 2 ISOL VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS MANIF ISOL 2 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE VALVE POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1698

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-30; J2-53

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1699 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-6; J2-61

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIF 2 ISOL VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87
SUBSYSTEM: ARCS
MDAC ID: 1700

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-6; J2-61

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1701 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-4; J2-97

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIF 2 ISOL VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1702 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, MCA 2
PART NUMBER: 54V76A114 J2-4; J2-97

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1703 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-69; A5R6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS MANIF ISOL 3 SWITCH" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1704

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-69; A5R6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1705 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-68; A5R2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS MANIF 3 ISOL SWITCH" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1706 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-68; A5R2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1707 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-32; A2R27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU MANIF 3 ISOL VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1708 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-32; A2R27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1709

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-34; A2R29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU MANIF 3 ISOL VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1710 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-34; A2R29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1711 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-91; A4R10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU MANIF 3 ISOL VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS MANIF ISOL 3 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE VALVE POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1712

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-91; A4R10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1713 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-33; A2R30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIF 3 ISOL VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1714

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-33; A2R30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1715 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-45; A2R28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIF 3 ISOL VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1716

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [. .] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J2-45; A2R28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1717 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-74; A5R3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS MANIF ISOL 4 SWITCH" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1718

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-74; A5R3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1719 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-74; A1R24

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "AFT L/R RCS MANIF 4 ISOL SWITCH" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1720

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-74; A1R24

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	1/22/87	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	ARCS	FLIGHT:	3/3
MDAC ID:	1721	ABORT:	3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-23; A2R44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU MANIF 4 ISOL VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1722

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-23; A2R44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1723 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-45; A2R47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU MANIF 4 ISOL VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1724

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-45; A2R47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1725 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-73; A3R10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE CAPABILITY TO STOP THE "OX & FU MANIF 4 ISOL VALVE" MOTORS WHEN VALVE REACHES OPEN OR CLOSED POSITION. POWER TO MOTORS CONTINUES UNTIL "AFT L/R RCS MANIF ISOL 4 SWITCH" IS MOVED TO ITS GPC POSITION, IF NOT THERE ALREADY, OR GPC CLOSE OR OPEN VALVE COMMANDS END. PROLONGED POWER TO VALVE MOTOR WILL NOT DAMAGE IT. ALSO LOSE VALVE POSITION TALKBACKS AND BARBERPOLE INDICATOR WILL BE STUCK ON BARBERPOLE INDICATION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1726

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-73; A3R10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1727 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-34; A2R46

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIF 4 ISOL VALVE" IN OPEN POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1728

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] . . B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-34; A2R46

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1729 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-46; A2R48

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIF 4 ISOL VALVE" IN CLOSED POSITION.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1730 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, MCA 3
PART NUMBER: 56V76A116 J3-46; A2R48

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1731 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-43; R125

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "AFT L/R RCS MANIFOLD 5 ISOL" SWITCH IN CLOSE POSITION. SWITCH OPERATION CAN BE DETERMINED FROM FOUR "MANIFOLD 5 ISOL VALVE" TALKBACKS AND FROM THE BARBERPOLE INDICATOR.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1732

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-43; R125

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "AFT L/R RCS MANIFOLD 5 ISOL" SWITCH IN CLOSE POSITION. LOSE VOLTAGE DIVISION TO MDM OA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1733 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-43; J2-29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFFECT TALKBACK FOR THE "AFT L/R RCS MANIFOLD 5 ISOL" SWITCH IN CLOSE POSITION. LOSE VOLTAGE DIVISION TO MDM OA1, SO PROVIDES FULL (0 TO 28 VDC) INSTEAD OF HALF (0 TO 14 VDC) VOLTAGE RANGE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1734

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-43; J2-29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "AFT L/R RCS MANIFOLD 5 ISOL" SWITCH IN CLOSE POSITION. SWITCH OPERATION CAN BE DETERMINED FROM FOUR "ISOL VALVE" TALKBACKS AND FROM THE BARBERPOLE INDICATOR.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	1/22/87	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	ARCS	FLIGHT:	3/3
MDAC ID:	1735	ABORT:	3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 56V76A123R J2-42; J2-27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR THE "AFT L/R RCS MANIFOLD 5 ISOL" SWITCH IN OPEN POSITION. SWITCH OPERATION CAN BE DETERMINED FROM FOUR "HE ISOL VLV" TALKBACKS AND FROM THE BARBERPOLE INDICATOR.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1736

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 56V76A123R J2-42; J2-27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1737 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-46; R118

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIFOLD 5 ISOL VALVE" IN OPEN POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1738 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-46; R118

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1739 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-41; R121

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "OX MANIFOLD 5 ISOL VALVE" IN CLOSED POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1740

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-41; R121

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	1/22/87	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	ARCS	FLIGHT:	3/3
MDAC ID:	1741	ABORT:	3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J8-66; R120

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE THE FOUR TALKBACKS FOR OPEN AND CLOSED POSITIONS OF BOTH "OX & FU MANIFOLD 5 ISOL VALVES". ALSO LOSE INHIBITS TO STOP OPENING OR CLOSING VALVES WHEN THEY ARE FULLY OPENED OR CLOSED, RESPECTIVELY, BUT THIS WILL NOT DAMAGE VALVES. ALSO LOSE INHIBITS TO STOP OPENING OR CLOSING VALVES WHEN THEY ARE FULLY OPENED OR CLOSED, RESPECTIVELY, BUT THIS WILL NOT DAMAGE VALVES.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1742

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J8-66; R120

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1743 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-45; R119

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK FOR "FU MANIFOLD 5 ISOL VALVE" IN OPENED POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1744

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-45; R119

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	1/22/87	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	ARCS	FLIGHT:	3/3
MDAC ID:	1745	ABORT:	3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-40; R122

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSE TALKBACK "FU MANIFOLD 5 ISOL VALVE" IN CLOSED POSITION. VALVE OPERATION CAN BE DETERMINED FROM OTHER TALKBACKS AND BARBERPOLE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1746

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J2-40; R122

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1747 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH
FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM CLOSE COMMANDS. IF THE SWITCH FAILS IN THE OPEN POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY THE SWITCH OR BY THE MDM COMMANDS. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM CONTACT SET 1, 2, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF EITHER THE INDIVIDUAL VALVE OR DUAL VALVE MDM CLOSE COMMANDS WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1748 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH
FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE SWITCH FAILS IN THE CLOSED POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY THE SWITCH OR BY THE MDM COMMAND. TO OPERATE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS AND ENTRY, CROSSFEED CAPABILITY, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	1/22/87	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	ARCS	FLIGHT:	3/1R
MDAC ID:	1749	ABORT:	2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH
FAILURE MODE: SWITCH FAILS IN THE GPC POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
VALVE CANNOT BE CONTROLLED BY SWITCH, ONLY BY MDM COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. FAILURE OF THE MDM COMMAND PATHS WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS AND ENTRY, CROSSFEED CAPABILITY, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1750 ABORT: 3/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF EITHER SETS OF OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN THE ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CAN BE OPENED OR CLOSED BY THE SWITCH OR BY MDM COMMANDS. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS AND ENTRY, CROSSFEED CAPABILITY, AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1751 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM CLOSE COMMANDS. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED, CAN BE OPENED ONLY BY SWITCH COMMANDS, AND CANNOT BE CLOSED BY SWITCH OR MDM COMMANDS. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DC, CC; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1752 ABORT: 3/3

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1753 ABORT: 3/3

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1754 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM CLOSE COMMANDS. IF EITHER OR BOTH SETS OF CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY SWITCH OR MDM COMMANDS, AND CANNOT BE CLOSED BY SWITCH COMMANDS, BY MDM COMMANDS. FAILURE OF EITHER THE INDIVIDUAL VALVE OR DUAL VALVE MDM CLOSE COMMANDS WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, CROSSFEED CAPABILITY, AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1755 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS AND THE OTHER SWITCH CLOSE CONTACTS. IF EITHER SETS OF CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CAN BE OPENED OR CLOSED BY SWITCH OR MDM COMMANDS. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1756 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 7, 8
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER SETS OF OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN THE ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CAN BE OPENED OR CLOSED BY THE SWITCH OR BY MDM COMMANDS. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, CROSSFEED CAPABILITY, AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1757 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 7, 8
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED, CAN BE OPENED ONLY BY SWITCH COMMANDS, AND CANNOT BE CLOSED BY SWITCH OR MDM COMMANDS. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DC, CC; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1758 ABORT: 3/3

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 9, 10
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1759

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 9, 10
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1760 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 11, 12
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM CLOSE COMMANDS. IF EITHER OR BOTH SETS OF CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY SWITCH OR MDM COMMANDS, AND CANNOT BE CLOSED BY SWITCH COMMANDS, ONLY BY MDM COMMANDS. FAILURE OF EITHER THE INDIVIDUAL VALVE OR DUAL VALVE MDM CLOSE COMMANDS WILL AFFECT CROSSFEED CAPABILITY, AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1761 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 11, 12
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S16; PNL O7 S19
PART NUMBER: 33V73A7S16; S19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM OPEN COMMANDS. IF EITHER SETS OF CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CAN BE OPENED OR CLOSED BY SWITCH OR MDM COMMANDS. WORST CASE FAILURE OF EITHER THE INDIVIDUAL VALVE AND DUAL VALVE MDM OPEN COMMANDS WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS AND ENTRY, CROSSFEED CAPABILITY, AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1762

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH
FAILURE MODE: SWITCH FAILS IN THE GPC POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S17, S18; PNL O7 S20, S21
PART NUMBER: 33V73A7S17, S18; 33V73A7S20, S21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM OPEN COMMANDS, AND BY THE PARALLEL ISOLATION VALVE ONLY TO OPEN THE VALVE. VALVE CANNOT BE CONTROLLED BY SWITCH, ONLY BY MDM COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. IF THE VALVE IS VALVE IS OPEN WHEN THE FAILURE OCCURS, AND THE MDM CLOSE COMMAND PATH FAILS, THIS WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS AND ENTRY, CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DB, CB

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1763 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH
FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S17, S18; PNL O7 S20, S21
PART NUMBER: 33V73A7S17, S18; 33V73A7S20, S21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM CLOSE COMMANDS. IF THE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED, CAN BE OPENED ONLY BY SWITCH COMMAND, BUT CANNOT BE RECLOSED BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK WEIGHT LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DB, CB

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1764 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH
FAILURE MODE: SWITCH FAILS IN CLOSED POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S17, S18; PNL O7 S20, S21
PART NUMBER: 33V73A7S17, S18; 33V73A7S20, S21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED OR GPC POSITION, THE VALVE WILL REMAIN CLOSED AND CANNOT BE OPENED BY SWITCH OR GPC COMMAND. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN, AND CAN BE CLOSED BY SWITCH COMMAND, BUT CANNOT BE REOPENED BY SWITCH OR MDM COMMANDS. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED OPERATIONS AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK WEIGHT LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DB, CB

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1765 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S17, S18; PNL O7 S20, S21
PART NUMBER: 33V73A7S17, S18; 33V73A7S20, S21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS OR BY THE PARALLEL ISOLATION VALVE. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE OPENED BY SWITCH COMMAND, ONLY BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED OPERATIONS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DB, CB

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1766 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SW OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S17, S18; PNL O7 S20, S21
PART NUMBER: 33V73A7S17, S18; 33V73A7S20, S21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE FALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED, CAN BE OPENED ONLY BY SWITCH COMMAND, BUT CANNOT BE RECLOSED BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF EITHER OF THE INDIVIDUAL VALVE MDM COMMANDS WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK WEIGHT CONSTRAINTS AND/OR CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DB, CB

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1767 ABORT: 3/3

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S17, S18; PNL O7 S20, S21
PART NUMBER: 33V73A7S17, S18; 33V73A7S20, S21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DB, CB

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1768

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S17, S18; PNL O7 S20, S21
PART NUMBER: 33V73A7S17, S18; 33V73A7S20, S21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS OR BY THE PARALLEL ISOLATION VALVE. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE OPENED BY SWITCH COMMAND, ONLY BY MDM COMMAND.

REFERENCES: VS70-943099 REV B EO B12, DB, CB

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1769 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S17, S18; PNL O7 S20, S21
PART NUMBER: 33V73A7S17, S18; 33V73A7S20, S21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CANNOT BE CLOSED BY SWITCH COMMAND, ONLY BY MDM COMMAND, AND CAN BR OPENED BY SWITCH OR MDM COMMANDS. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED OPERATIONS AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK WEIGHT LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DB, CB

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1770 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S17, S18; PNL O7 S20, S21
PART NUMBER: 33V73A7S17, S18; 33V73A7S20, S21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED OR GPC POSITION, THE VALVE WILL REMAIN CLOSED AND CANNOT BE OPENED BY SWITCH OR GPC COMMAND. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN, AND CAN BE CLOSED BY SWITCH COMMAND, BUT CANNOT BE REOPENED BY SWITCH OR MDM COMMANDS. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND USE THE GPC READ/WRITE PROCEDURES. FAILURE OF EITHER OF THE INDIVIDUAL VALVE MDM COMMANDS WILL AFFECT CROSSFEED OPERATIONS AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK WEIGHT LANDING CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DB, CB

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1771

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH
FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE SWITCH FAILS IN THE OPEN POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY THE SWITCH OR BY THE MDM COMMANDS. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM CONTACT SETS 1, 2, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF EITHER THE INDIVIDUAL VALVE OR DUAL VALVE MDM COMMANDS WILL AFFECT ONORBIT CROSSFEED OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, DC, CC

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1772

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH
FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE SWITCH FAILS IN THE CLOSED POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY THE SWITCH OR BY THE MDM COMMAND. TO OPERATE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS OR TAL ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1773 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH
FAILURE MODE: SWITCH FAILS IN THE GPC POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
VALVE CANNOT BE CONTROLLED BY SWITCH, ONLY BVY MDM COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. FAILURE OF THE MDM COMMAND PATHS WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1774 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/2R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER SETS OF OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN THE ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE OPENED OR CLOSED BY THE SWITCH OR BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1775 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED, CAN BE OPENED ONLY BY SWITCH COMMANDS, AND CANNOT BE CLOSED BY SWITCH OR MEM COMMANDS. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT CROSSFEED OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, DD, CD; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1776

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1777 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1778 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF EITHER OR BOTH SETS OF CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE CLOSED BY SWITCH COMMANDS, ONLY BY MDM COMMANDS. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT CROSSFEED OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1779 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF EITHER SETS OF CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CAN BE OPENED OR CLOSED BY SWITCH OR MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES. TO OPERATE THE VALVE, THE CREW MUST REMOVE POWER FROM THE SWITCH'S CONTROL BUSSES AND THEN USE THE GPC READ/WRITE PROCEDURES.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1780 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH OPEN CONTACTS 7, 8
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH OPEN CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER SETS OF OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN THE ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE OPENED OR CLOSED BY THE SWITCH OR BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1781 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH OPEN CONTACTS 7, 8
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH OPEN CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED, CAN BE OPENED ONLY BY SWITCH COMMANDS, AND CANNOT BE CLOSED BY SWITCH OR MEM COMMANDS. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT CROSSFEED OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, DD, CD; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1782

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH GPC CONTACTS 9, 10
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH GPC CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1783 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH GPC CONTACTS 9, 10
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH GPC CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1784 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH CLOSE CONTACTS 11, 12
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH CLOSE CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF EITHER OR BOTH SETS OF CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE CLOSED BY SWITCH COMMANDS, ONLY BY MDM COMMANDS. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT CROSSFEED OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1785 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 1/2 SWITCH CLOSE CONTACTS 11, 12
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2
5) L/R OX & FU CROSSFEED VLV 1/2 SWITCH CLOSE CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: PNL O7 S32; PNL O7 S34
PART NUMBER: 33V73A7S32; S34

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF EITHER SETS OF CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CAN BE OPENED OR CLOSED BY SWITCH OR MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES. TO OPERATE THE VALVE, THE CREW MUST REMOVE POWER FROM THE SWITCH'S CONTROL BUSSES AND THEN USE THE GPC READ/WRITE PROCEDURES.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/1R
MDAC ID: 1786 ABORT: 2/1R

ITEM: MASTER RCS CROSSFEED SWITCH
FAILURE MODE: SWITCH FAILS IN FEED FROM RIGHT OR FEED FROM LEFT POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2 & 3/4/5
5) MASTER RCS CROSSFEED SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S36
PART NUMBER: 33V73A7S36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
RCS/RCS CROSSFEED IS POSSIBLE ONLY FROM THE RIGHT OR ONLY FROM THE LEFT. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT CROSSFEED OPERATIONS AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1787 ABORT: 2/1R

ITEM: MASTER RCS CROSSFEED SWITCH
FAILURE MODE: SWITCH FAILS IN OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2 & 3/4/5
5) MASTER RCS CROSSFEED SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S36
PART NUMBER: 33V73A7S36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL RESULT IN THE LOSS OF THE GPC CONTROLLED RCS/RCS CROSSFEED. CROSSFEED CAN BE ACCOMPLISHED BY MDM COMMANDS OR BY MANUAL RCS SWITCH RECONFIGURATION.
FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1788 ABORT: 2/1R

ITEM: MASTER RCS CROSSFEED SWITCH FEED FROM RIGHT OR FEED FROM LEFT SWITCH CONTACTS
FAILURE MODE: SWITCH FEED FROM RIGHT OR FEED FROM LEFT CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2 & 3/4/5
5) MASTER RCS CROSSFEED SWITCH FEED FROM RIGHT OR FEED FROM LEFT SWITCH CONTACTS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S36
PART NUMBER: 33V73A7S36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CROSSFEED CAN BE CONTROLLED BY MDM COMMANDS, OR BY MANUAL RCS SWITCH RECONFIGURATION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO CROSSFEED, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/1R
MDAC ID: 1789 ABORT: 2/1R

ITEM: MASTER RCS CROSSFEED SWITCH FEED FROM RIGHT OR FEED FROM LEFT SWITCH CONTACTS
FAILURE MODE: SWITCH FEED FROM RIGHT OR FEED FROM LEFT CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2 & 3/4/5
5) MASTER RCS CROSSFEED SWITCH FEED FROM RIGHT OR FEED FROM LEFT SWITCH CONTACTS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	2/1R
ONORBIT:	3/2R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S36
PART NUMBER: 33V73A7S36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
RCS/RCS CROSSFEED IS POSSIBLE ONLY FROM THE RIGHT OR ONLY FROM THE LEFT. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT CROSSFEED OPERATIONS AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1790 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH
FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE SWITCH FAILS IN THE OPEN POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY THE SWITCH OR BY THE MDM COMMANDS. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM CONTACT SET 1, 2, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF EITHER THE INDIVIDUAL VALVE OR DUAL VALVE MDM COMMANDS WILL AFFECT ONORBIT CROSSFEED OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	1/22/87	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	ARCS	FLIGHT:	3/1R
MDAC ID:	1791	ABORT:	2/1R

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH
FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE SWITCH FAILS IN THE CLOSED POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY THE SWITCH OR BY THE MDM COMMAND. TO OPERATE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM TRHE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS OR TAL ABORTS TO MEEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1792 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH
FAILURE MODE: SWITCH FAILS IN THE GPC POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
VALVE CANNOT BE CONTROLLED BY SWITCH, ONLY BY MDM COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. FAILURE OF THE MDM COMMAND PATHS WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/ORO THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1793 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER SETS OF OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE OPENED OR CLOSED BY THE SWITCH OR BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1794 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED, CAN BE OPENED ONLY BY SWITCH COMMANDS, AND CANNOT BE CLOSED BY SWITCH OR MDM COMMANDS. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT CROSSFEED OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, DD, CD; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1795 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1796 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1797 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF EITHER OR BOTH SETS OF CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE CLOSED BY SWITCH COMMANDS, ONLY BY MDM COMMANDS. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED OPERATIONS, AND MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ENTRY OR ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1798 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF EITHER SET OF CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CAN BE OPENED OR CLOSED BY SWITCH OR MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CS SAFETY BOUNDARIES. TO OPERATE THE VALVE, THE CREW MUST REMOVE POWER FROM THE SWITCH'S CONTROL BUSSES AND THEN USE THE GPC READ/WRITE PROCEDURES.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1799 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 7, 8
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER SETS OF OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE OPENED OR CLOSED BY THE SWITCH OR BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TAK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

C-3

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1800 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 7, 8
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF EITHER OR BOTH SETS OF OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED, CAN BE OPENED ONLY BY SWITCH COMMANDS, AND CANNOT BE CLOSED BY SWITCH OR MDM COMMANDS. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT CROSSFEED OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, DD, CD; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1801 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH GPC CONTACTS 9, 10
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH GPC CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1802 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH GPC CONTACTS 9, 10
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH GPC CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1803 ABORT: 3/3

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 11, 12
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF EITHER OR BOTH SETS OF CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CANNOT BE CLOSED BY SWITCH COMMANDS, ONLY BY MDM COMMANDS. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT CROSSFEED OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1804 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 11, 12
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 3/4/5
5) L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: PNL O7 S33; PNL O7 S35
PART NUMBER: 33V73A7S33; S35

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF EITHER SET OF CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION AND CAN BE OPENED OR CLOSED BY SWITCH OR MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL AFFECT CROSSFEED CAPABILITY AND MAY CAUSE THE INABILITY TO BURN ENOUGH PROPELLANT DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CS SAFETY BOUNDARIES. TO OPERATE THE VALVE, THE CREW MUST REMOVE POWER FROM THE SWITCH'S CONTROL BUSSES AND THEN USE THE GPC READ/WRITE PROCEDURES.

REFERENCES: VS70-943099 REV B EO B12, DD, CD

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1805

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S22; PNL O7 S27
PART NUMBER: 33V73A7S22; S27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF THE SWITCH FAILS IN THE OPEN POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1806 ABORT: 2/1R

ITEM: MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S22; PNL O7 S27
PART NUMBER: 33V73A7S22; S27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE SWITCH FAILS IN THE CLOSED POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPEED BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE POWER FROM THE SWITCH'S CONTROL BUSSES AND USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1807 ABORT: 2/1R

ITEM: MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE GPC POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S22; PNL O7 S27
PART NUMBER: 33V73A7S22; S27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
VALVE CANNOT BE CONTROLLED BY SWITCH, ONLY BY MDM OPEN OR CLOSE COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. FAILURE OF THE SWITCH WHILE THE VALVE IS IN THE CLOSED POSITION AND FAILURE OF EITHER INDIVIDUAL VALVE AND DUAL VALVE MDM OPEN COMMAND PATHS WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1808 ABORT: 2/1R

ITEM: MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/3R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S22; PNL O7 S27
PART NUMBER: 33V73A7S22; S27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED ONLY BY MDM COMMAND, AND CAN CLOSE BY THE SWITCH OR THE MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DUMPS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1809 ABORT: 3/3

ITEM: MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S22; PNL O7 S27
PART NUMBER: 33V73A7S22; S27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM CLOSE COMMANDS. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED AND CAN BE OPENED WITH THE SWITCH, BUT CANNOT BE CLOSED AGAIN BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1810 ABORT: 3/3

ITEM: MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S22; PNL O7 S27
PART NUMBER: 33V73A7S22; S27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1811 ABORT: 3/3

ITEM: MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S22; PNL O7 S27
PART NUMBER: 33V73A7S22; S27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1812 ABORT: 3/3

ITEM: MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S22; PNL O7 S27
PART NUMBER: 33V73A7S22; S27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM CLOSE COMMANDS. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPEED BY SWITCH COMMAND, BUT CANNOT BE CLOSED BY SWITCH COMMAND, ONLY BY MDM COMMAND.
FAILURE OF ALL REDUNDANCY WILL CAUSE INABILITY TO CLOSE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1813 ABORT: 2/1R

ITEM: MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU ISOL VLVS
5) MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S22; PNL O7 S27
PART NUMBER: 33V73A7S22; S27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED OR GPC POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY SWITCH OR MDM COMMAND. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN AND CAN BE CLOSED WITH THE SWITCH, BUT CANNOT BE OPENED AGAIN BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PRO CEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1814 ABORT: 3/3

ITEM: MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S23; PNL O7 S28
PART NUMBER: 33V73A7S23; S28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF THE SWITCH FAILS IN THE OPEN POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1815 ABORT: 2/1R

ITEM: MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S23; PNL O7 S28
PART NUMBER: 33V73A7S23; S28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE SWITCH FAILS IN THE CLOSED POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPEED BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE POWER FROM THE SWITCH'S CONTROL BUSSES AND USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1816 ABORT: 2/1R

ITEM: MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE GPC POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S23; PNL O7 S28
PART NUMBER: 33V73A7S23; S28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
VALVE CANNOT BE CONTROLLED BY SWITCH, ONLY BY MDM OPEN OR CLOSE COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. FAILURE OF THE SWITCH WHILE THE VALVE IS IN THE CLOSED POSITION AND FAILURE OF EITHER INDIVIDUAL VALVE AND DUAL VALVE MDM OPEN COMMAND PATHS WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1817 ABORT: 2/1R

ITEM: MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/3R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S23; PNL O7 S28
PART NUMBER: 33V73A7S23; S28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED ONLY BY MDM COMMAND, AND CAN CLOSE BY THE SWITCH OR THE MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DUMPS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1818 ABORT: 3/3

ITEM: MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S23; PNL O7 S28
PART NUMBER: 33V73A7S23; S28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM CLOSE COMMANDS. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED AND CAN BE OPENED WITH THE SWITCH, BUT CANNOT BE CLOSED AGAIN BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1819 ABORT: 3/3

ITEM: MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S23; PNL O7 S28
PART NUMBER: 33V73A7S23; S28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1820 ABORT: 3/3

ITEM: MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S23; PNL O7 S28
PART NUMBER: 33V73A7S23; S28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1821 ABORT: 3/3

ITEM: MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S23; PNL O7 S28
PART NUMBER: 33V73A7S23; S28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM CLOSE COMMANDS. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPEED BY SWITCH COMMAND, BUT CANNOT BE CLOSED BY SWITCH COMMAND, ONLY BY MDM COMMAND.
FAILURE OF ALL REDUNDANCY WILL CAUSE INABILITY TO CLOSE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1822 ABORT: 2/1R

ITEM: MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU ISOL VLVS
5) MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S23; PNL O7 S28
PART NUMBER: 33V73A7S23; S28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED OR GPC POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY SWITCH OR MDM COMMAND. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN AND CAN BE CLOSED WITH THE SWITCH, BUT CANNOT BE OPENED AGAIN BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PRO CEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TAK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87
SUBSYSTEM: ARCS
MDAC ID: 1823

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S24; PNL O7 S29
PART NUMBER: 33V73A7S24; S29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF THE SWITCH FAILS IN THE OPEN POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1824 ABORT: 2/1R

ITEM: MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S24; PNL O7 S29
PART NUMBER: 33V73A7S24; S29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE SWITCH FAILS IN THE CLOSED POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPEED BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE POWER FROM THE SWITCH'S CONTROL BUSSES AND USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1825 ABORT: 2/1R

ITEM: MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE GPC POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S24; PNL O7 S29
PART NUMBER: 33V73A7S24; S29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
VALVE CANNOT BE CONTROLLED BY SWITCH, ONLY BY MDM OPEN OR CLOSE COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. FAILURE OF THE SWITCH WHILE THE VALVE IS IN THE CLOSED POSITION AND FAILURE OF EITHER INDIVIDUAL VALVE AND DUAL VALVE MDM OPEN COMMAND PATHS WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1826 ABORT: 2/1R

ITEM: MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/3R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S24; PNL O7 S29
PART NUMBER: 33V73A7S24; S29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED ONLY BY MDM COMMAND, AND CAN CLOSE BY THE SWITCH OR THE MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DUMPS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1827 ABORT: 3/3

ITEM: MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S24; PNL O7 S29
PART NUMBER: 33V73A7S24; S29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM CLOSE COMMANDS. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED AND CAN BE OPENED WITH THE SWITCH, BUT CANNOT BE CLOSED AGAIN BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1828 ABORT: 3/3

ITEM: MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S24; PNL O7 S29
PART NUMBER: 33V73A7S24; S29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1829 ABORT: 3/3

ITEM: MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S24; PNL O7 S29
PART NUMBER: 33V73A7S24; S29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1830 ABORT: 3/3

ITEM: MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S24; PNL O7 S29
PART NUMBER: 33V73A7S24; S29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM CLOSE COMMANDS. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPEED BY SWITCH COMMAND, BUT CANNOT BE CLOSED BY SWITCH COMMAND, ONLY BY MDM COMMAND.
FAILURE OF ALL REDUNDANCY WILL CAUSE INABILITY TO CLOSE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1831 ABORT: 2/1R

ITEM: MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU ISOL VLVS
5) MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S24; PNL O7 S29
PART NUMBER: 33V73A7S24; S29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED OR GPC POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY SWITCH OR MDM COMMAND. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN AND CAN BE CLOSED WITH THE SWITCH, BUT CANNOT BE OPENED AGAIN BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	1/22/87	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	ARCS	FLIGHT:	3/3
MDAC ID:	1832	ABORT:	3/3

ITEM: MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S25; PNL O7 S30
PART NUMBER: 33V73A7S25; S30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM COMMANDS. IF THE SWITCH FAILS IN THE OPEN POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1833 ABORT: 2/1R

ITEM: MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S25; PNL O7 S30
PART NUMBER: 33V73A7S25; S30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM COMMANDS. IF THE SWITCH FAILS IN THE CLOSED POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPEED BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE POWER FROM THE SWITCH'S CONTROL BUSSES AND USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1834 ABORT: 2/1R

ITEM: MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE GPC POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S25; PNL O7 S30
PART NUMBER: 33V73A7S25; S30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
VALVE CANNOT BE CONTROLLED BY SWITCH, ONLY BY MDM OPEN OR CLOSE COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. FAILURE OF THE SWITCH WHILE THE VALVE IS IN THE CLOSED POSITION AND FAILURE OF EITHER INDIVIDUAL VALVE AND DUAL VALVE MDM OPEN COMMAND PATHS WILL AFFECT PROPELLANT DUMP LENGTHS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS, AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1835 ABORT: 2/1R

ITEM: MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH OPEN COMMAND 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH OPEN COMMAND 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/3R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S25; PNL O7 S30
PART NUMBER: 33V73A7S25; S30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED ONLY BY MDM COMMAND, AND CAN CLOSE BY THE SWITCH OR THE MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS DUMPS DURING ABORTS OR ENTRY, MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT DURING RTLS ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1836 ABORT: 3/3

ITEM: MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH OPEN COMMAND 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH OPEN COMMAND 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S25; PNL O7 S30
PART NUMBER: 33V73A7S25; S30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY MDM CLOSE COMMANDS. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE VALVE WILL OPEN AND CANNOT BE CLOSED BY SWITCH OR MDM COMMAND. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, THE VALVE WILL REMAIN CLOSED AND CAN BE OPENED WITH THE SWITCH, BUYT CANNOT BE CLOSED AGAIN BY SWITCH OR MDM COMMAND. TO CLOSE THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1837 ABORT: 3/3

ITEM: MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH GPC COMMAND 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH GPC COMMAND 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S25; PNL O7 S30
PART NUMBER: 33V73A7S25; S30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1838 ABORT: 3/3

ITEM: MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH GPC COMMAND 3, 4
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH GPC COMMAND 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S25; PNL O7 S30
PART NUMBER: 33V73A7S25; S30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DE, CE

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1839 ABORT: 3/3

ITEM: MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH CLOSE COMMAND 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH CLOSE COMMAND 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S25; PNL O7 S30
PART NUMBER: 33V73A7S25; S30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM CLOSE COMMANDS. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPEED BY SWITCH COMMAND, BUT CANNOT BE CLOSED BY SWITCH COMMAND, ONLY BY MDM COMMAND.
FAILURE OF ALL REDUNDANCY WILL CAUSE INABILITY TO CLOSE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1840 ABORT: 2/1R

ITEM: MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH CLOSE COMMAND 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU ISOL VLVS
5) MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH CLOSE COMMAND 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S25; PNL O7 S30
PART NUMBER: 33V73A7S25; S30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED OR GPC POSITION, THE VALVE WILL CLOSE AND CANNOT BE OPENED BY SWITCH OR MDM COMMAND. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN AND CAN BE CLOSED WITH THE SWITCH, BUT CANNOT BE OPENED AGAIN BY SWITCH OR MDM COMMAND. TO OPEN THE VALVE, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CONTACTS, AND THEN USE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT PROPELLANT DUMP LENGTHS MAY CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS DURING ABORTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES, AND MAY AFFECT ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099 REV B EO B12, DF, CF

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1841 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE OPEN POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO REDUNDANCY PROVIDED TO CLOSE THE VALVE. IF THE SWITCH FAILS IN THE OPEN POSITION WHILE THE VALVE IS IN ANY POSITION, THE VALVE WILL OPEN. FAILURE WILL CAUSE THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1842 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE CLOSED POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMAND. IF THE SWITCH FAILS IN THE CLOSED POSITION WHILE THE VALVE IS IN ANY POSITION, THE VALVE WILL CLOSE. IF THE MDM OPEN COMMAND IS ALSO PRESENT, OR THE SWITCH OPEN COMMAND IS ALSO PRESENT THE VALVE WILL CYCLE OPEN AND CLOSED UNTIL THE MDM OR SWITCH OPEN COMMAND IS REMOVED, OR UNTIL THE CONTROL BUS POWER IS REMOVED FROM EITHER OF THE SWITCH'S CLOSE CONTACTS. TO OPEN THE VALVE, CREW MUST REMOVE POWER FROM EITHER OF THE SWITCH'S CLOSE CONTACTS, AND USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL AFFECT ONORBIT OPREATIONS, AND WILL CAUSE THE LOSS OF THE VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1843 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH
FAILURE MODE: SWITCH FAILS IN THE GPC POSITION

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS. TO OPERATE THE VALVE, THE CREW MUST USE THE GPC READ/WRITE PROCEDURES. IF THE VALVE IS CLOSED AND THE MDM OPEN COMMAND PATH FAILS, THE VALVE CANNOT BE OPENED BY THE MDM SWITCH COMMANDS, CAUSING THE LOSS OF THE VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1844 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH OPEN
CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1845 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1846 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1847 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1848 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM CLOSE COMMAND. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY THE SWITCH OR BY THE MDM COMMAND, AND CANNOT BE CLOSED BY THE SWITCH COMMAND, ONLY BY THE MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1849 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMANDS AND THE OTHER SWITCH CLOSE CONTACTS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE GPC OR CLOSED POSITION, THE VALVE WILL CLOSE, AND CANNOT BE OPENED BY MDM COMMAND, ONLY BY THE SWITCH COMMAND. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN POSITION, THE VALVE WILL REMAIN OPEN, AND CANNOT BE CLOSED BY MDM COMMAND, ONLY BY SWITCH COMMAND. TO OPEN THE VALVE WITH THE MDM COMMAND, THE CREW MUST REMOVE CONTROL BUS POWER FROM THE CLOSE CONTACT SET 5,6 THEN USE THE GPC READ/WRITE PROCEDURES. FAILURE OF ALL REDUNDANCY WILL CAUSE THE LOSS OF THE VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1850 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 7, 8
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMAND. IF THE OPEN CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE CLOSED BY SWITCH OR MDM COMMAND, BUT CANNOT BE OPENED BY SWITCH COMMAND, ONLY BY MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO OPEN THE VALVE, AND WILL CAUSE LOSS OF THE VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1851 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 7, 8
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO REDUNDANCY PROVIDED TO CLOSE THE VALVE. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE OPEN OR GPC POSITION, THE VALVE WILL OPEN. IF THE OPEN CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN THE CLOSED POSITION, OR IF THE MDM CLOSE COMMAND IS ALSO PRESENT, THE VALVE WILL CYCLE OPEN AND CLOSED UNTIL CONTROL BUS POWER TO THE OPEN OR CLOSE CONTACTS IS REMOVED, OR UNTIL THE MDM CLOSE COMMAND IS REMOVED.
FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1852 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 9, 10
FAILURE MODE: SWITCH GPC CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE MDM OPEN COMMAND AND THE MANUAL SWITCH COMMAND. IF THE GPC CONTACTS FAIL OPEN, THE VALVE CAN BE OPENED BY SWITCH OR MDM COMMAND, CAN BE CLOSED BY SWITCH COMMAND, AND CANNOT BE CLOSED BY MDM COMMAND UNLESS THE SWITCH IS IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE LOSS OF THE VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1853 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 9, 10
FAILURE MODE: SWITCH GPC CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER CLOSE CONTACTS AND THE SWITCH AND MDM OPEN COMMANDS. FIRST FAILURE WILL HAVE NO EFFECT. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO OPEN THE VALVE AMD LOSS OF THE VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1854 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 11, 12
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL OPEN

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO REDUNDANCY. IF THE CLOSE CONTACTS FAIL OPEN WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, CAN BE OPENED BY THE SWITCH OR BY MDM COMMAND, BUT CANNOT BE CLOSED BY THE SWITCH OR MDM COMMAND. FAILURE WILL CAUSE THE INABILITY TO CLOSE THE VALVE.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1855 ABORT: 3/3

ITEM: MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 11, 12
FAILURE MODE: SWITCH CLOSE CONTACTS FAIL CLOSED

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 5, L/R OX & FU ISOL VLVS
5) MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [3] B [F] C [P]

LOCATION: PNL O7 S26; PNL O7 S31
PART NUMBER: 33V73A7S26; S31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER SWITCH CLOSE CONTACTS. IF THE CLOSE CONTACTS FAIL CLOSED WHILE THE SWITCH IS IN ANY POSITION, THE VALVE WILL REMAIN IN THAT POSITION, AND CAN BE CLOSED AND OPENED BY SWITCH OR MDM COMMAND. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO OPEN THE VALVE, AND LOSS OF THE VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1856 ABORT: 2/1R

ITEM: L/R OX & FU CROSSFEED VLV 1/2 & 3/4/5 SWITCH TALKBACK
FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU CROSSFEED VLV 1/2 & 3/4/5 SWITCH
5) L/R OX & FU CROSSFEED VLV 1/2 & 3/4/5 SWITCH TALKBACK
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 DS23, DS24; PNL O7 DS25, DS26
PART NUMBER: 33V73A7DS23, DS24; DS25, DS26

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFT L/R RCS CROSSFEED 1/2 & 3/4/5 POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1857 ABORT: 2/1R

ITEM: L/R OX & FU TK ISOL VLV 1/2 SWITCH TALKBACK
FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 1/2 SWITCH
5) L/R OX & FU TK ISOL VLV 1/2 SWITCH TALKBACK
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 DS7; PNL O7 DS10
PART NUMBER: 33V73A7DS7; DS10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFT L/R RCS TK ISOL 1/2 POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1858 ABORT: 3/1R

ITEM: L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH TALKBACK
FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH
5) L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH TALKBACK
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 DS8, DS9; PNL O7 DS11, DS12
PART NUMBER: 33V73DS8, DS9; DS11, DS12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFT L/R RCS TK ISOL 3/4/5 POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX A OR B VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE A OR B VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 1859 ABORT: 2/1R

ITEM: MANIFOLD 1, 2, 3, 4, 5, L/R OX & FU VLV SWITCH TALKBACK
FAILURE MODE: ERRONEOUS INDICATION (FAILS HIGH, FAILS LOW, FAILS MIDTRAVEL)

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) MANIFOLD 1, 2, 3, 4, 5, L/R OX & FU ISOL VLV SWITCH
5) MANIFOLD 1, 2, 3, 4, 5, L/R OX & FU VLV SWITCH TALKBACK
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O7 DS13-DS17; PNL O7 DS18-DS22
PART NUMBER: 33V73A7DS13-DS17; DS18-DS22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
AFT RCS MANIFOLD 1, 2, 3, 4, 5 L/R POSITION INDICATION WOULD FALSELY SHOW A BARBERPOLE INDICATING EITHER THE FU OR OX A OR B VALVES ARE STUCK PARTIALLY OPEN/CLOSED OR THERE IS A POSITION MISMATCH BETWEEN THE TWO VALVES. LOSS OF ALL REDUNDANCY WOULD RESULT IN LOSS OF DIRECT VALVE TALKBACK TO CREW. WORST CASE WOULD BE FALSELY FAILING THE VALVE CLOSED RESULTING IN LOSS OF MISSION DUE TO SAFETY CONSIDERATIONS (ONE FAILURE AWAY FROM LOSS OF VEHICLE/LIFE).

REFERENCES: VS70-943099 REV B EO B12, DA, CA

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1860 ABORT: 3/3

ITEM: L/R FU TANK ULLAGE PPRESS SENSOR
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) FU TK
5) L/R FU TANK ULLAGE PPRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT205; 52V42PT305

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1861 ABORT: 3/3

ITEM: L/R FU TANK ULLAGE PPRESS SENSOR
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) FU TK
5) L/R FU TANK ULLAGE PPRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT205; 52V42PT305

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1862 ABORT: 3/3

ITEM: L/R FU TANK OUT PRESS SENSOR
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) FU TK
5) L/R FU TANK OUT PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT207; 52V42PT307

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1863 ABORT: 3/3

ITEM: L/R FU TANK OUT PRESS SENSOR
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) FU TK
5) L/R FU TANK OUT PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT207; 52V42PT307

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1864 ABORT: 3/3

ITEM: L/R OX TANK ULLAGE PPRESS SENSOR
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) OX TK
5) L/R OX TANK ULLAGE PPRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT206; 52V42PT306

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1865 ABORT: 3/3

ITEM: L/R OX TANK ULLAGE PPRESS SENSOR
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) OX TK
5) L/R OX TANK ULLAGE PPRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT206; 52V42PT306

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1866 ABORT: 3/3

ITEM: L/R OX TANK OUT PRESS SENSOR
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) OX TK
5) L/R OX TANK OUT PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT208; 52V42PT308

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1867 ABORT: 3/3

ITEM: L/R OX TANK OUT PRESS SENSOR
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) OX TK
5) L/R OX TANK OUT PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT208; 52V42PT308

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK TEMPERATURE SENSOR AND REDUNDANT PRESSURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1868 ABORT: 3/3

ITEM: L/R FU TANK TEMP-1 TEMP SENSOR
FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) FU TK
5) L/R FU TANK TEMP-1 TEMP SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42TT203; 52V42TT303

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK PRESSURE SENSORS WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1869 ABORT: 3/3

ITEM: L/R FU TANK TEMP-1 TEMP SENSOR
FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) FU TK
5) L/R FU TANK TEMP-1 TEMP SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42TT203; 52V42TT303

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK PRESSURE SENSORS WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1870 ABORT: 3/3

ITEM: L/R OX TANK TEMP-1 TEMP SENSOR
FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) OX TK
5) L/R OX TANK TEMP-1 TEMP SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42TT204; 52V42TT304

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK PRESSURE SENSORS WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 1871

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX TANK TEMP-1 TEMP SENSOR
FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) PROP STOR & DIST SUBSYSTEM
4) OX TK
5) L/R OX TANK TEMP-1 TEMP SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42TT204; 52V42TT304

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF TANK PRESSURE SENSORS WILL CAUSE CREW AND GROUND DIFFICULTY IN DETECTING A TANK LEAK. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1872 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC22

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1873 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC22

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1874 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132RPC18

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1875 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132RPC18

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1876 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC18

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1877 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC18

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. WITH THE LOSS OF THE GATE SIGNAL TO THE VERNIER DRIVER POWER CIRCUITS, THE ONORBIT VERNIER JETS ARE UNAVAILABLE. AFFECTS PRI JET ONORBIT OPERATIONS (RNDV, PROX OPS) CRIT 3/2R. AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1878 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132RPC8

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1879 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132RPC8

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1880 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC16

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1881 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC16

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1882 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC36

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1883 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC36

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1884 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC23

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER POWER REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1885

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC23

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1886 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC19

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1887

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC19

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1888 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132RPC17

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1889 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC39

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1890 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC39

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1891 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132RPC17

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1892 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132RPC7

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1893 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132RPC7

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS AND LOGIC. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. WITH THE LOSS OF THE GATE SIGNAL TO THE VERNIER DRIVER POWER CIRCUITS, THE ONORBIT VERNIER JETS ARE UNAVAILABLE. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS) CRIT 3/2R. AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1894

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC40

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1895 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC40

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1896 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC21

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1897 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC21

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1898 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC17

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1899 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC17

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1900

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC37

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1901 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC37

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1902 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC38

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1903 ABORT: 2/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133RPC38

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 1904 ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC41

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO VERNIER JETS L5L AND L5D MANIFOLD DRIVER POWER CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1905

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC41

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER TO VERNIER MANIFOLD L5 DRIVER POWER CIRCUIT. LOSS OF L5L AND L5D VERNIER JETS, AND RESULTING IN LOSS OF VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1906

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC40

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO VERNIER JETS L5L AND L5D MANIFOLD DRIVER POWER CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1907

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) CONTROLLER, REMOTE POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131RPC40

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER TO VERNIER MANIFOLD L5 DRIVER POWER CIRCUIT. LOSS OF L5L AND L5D VERNIER JETS, AND RESULTING IN LOSS OF VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1908

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A3CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1909

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A3CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1910 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A3CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1911

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A3CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1912

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A2CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1913 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A2CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING ABORTS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF THE VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1914

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1915 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDV, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1916

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1917 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1918

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1919 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1920

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A2CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES. ONORBIT, THE LOSS OF VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1921 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A2CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1922

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1923 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1924

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1925 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1926

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1927 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1928

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1929 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN DIODE REMOVES CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1930

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A2CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1931 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A2CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1932

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A3CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1933 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A3CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH
(TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1934

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1935 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1936

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1937 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN DIODE REMOVES CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1938

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A3CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1939 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A3CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1940

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A2CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1941 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A2CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1942

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A2CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1943 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A2CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1944

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A3CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1945 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A3CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1946

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1947 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1948

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1949 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1950

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1951 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1952

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A3CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1953 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A3CR8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1954

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1955 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1956

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1957 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1958

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A3CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1959 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A3CR7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. ONORBIT, LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1960

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1961 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1962

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1963 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN DIODE REMOVES CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1964 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A2CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1965 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A2CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1966

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 3, PCA 3
PART NUMBER: 56V76A133A3CR13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1967 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 3, PCA 3
PART NUMBER: 56V76A133A3CR13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1968

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1969 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1970

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY CAUSE A CHANGE IN CURRENT FLOW BETWEEN TWO DIFFERENT BUSES, DUE TO UNEQUAL BUS VOLTAGE AND CURRENT SHARING. THE 1.2K CURRENT LIMITING RESISTOR WILL MINIMIZE CHANGE IN CONTROL BUS CURRENT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1971 ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN DIODE REMOVES CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1972

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A3CR5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1973 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A3CR5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1974

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A2CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
SHORTED DIODE ALLOWS REDUNDANT CIRCUIT OPERATION. MAY AFFECT CURRENT FLOW BETWEEN THE TWO DIFFERENT BUSES. DUE TO UNEQUAL BUS VOLTAGES AND CURRENT SHARING, ONE OF THE RPC'S IN THE REDUNDANT CIRCUIT COULD TRIP OPEN. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINT AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1975 ABORT: 2/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A2CR1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1976

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A3CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO IMPACT ON CIRCUIT OPERATION. CURRENT LIMITING RESISTOR WILL PROTECT OTHER CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1977

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A3CR2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER TO VERNIER MANIFOLD L5 DRIVER POWER CIRCUIT. LOSS OF L5L AND L5D VERNIER JETS, AND RESULTING IN LOSS OF VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1978

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 54V76A131A3CR3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO IMPACT ON CIRCUIT OPERATION. CURRENT LIMITING RESISTOR WILL PROTECT OTHER CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 1979 ABORT: 3/3

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) DIODE
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 54V76A131A3CR3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER TO VERNIER MANIFOLD R5 DRIVER POWER CIRCUIT. LOSS OF R5R AND R5D VERNIER JETS, AND RESULTING IN LOSS OF VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1980

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J9-46 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1981

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DRIVER, HYBRID
6)
7)
8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J9-46 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK,

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1982 ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J9-46 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1983

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J9-46 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1984

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J9-47 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1985

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J9-47 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1986

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] · · B [P] C [P]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J9-45 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER POWER REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1987 ABORT: 2/1R

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J9-45 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1988 ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J9-46 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1989 ABORT: 2/1R

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J9-46 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1990

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J9-45 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1991

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J9-45 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1992 ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J9-47 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1993 ABORT: 2/1R

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J9-47 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

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INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1994 ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J9-45 (182) TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO MANIFOLD DRIVER AND LOGIC CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE. PRI MANIFOLD DRIVER PWR REQUIRED OFF FOR FCS CHECKOUT.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 1995 ABORT: 2/1R

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J9-45 (182) TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1996

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J4-7 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO VERNIER JETS L5L AND L5D MANIFOLD DRIVER POWER CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER CONSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1997

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J4-7 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER TO VERNIER MANIFOLD L5 DRIVER POWER CIRCUIT. LOSS OF L5L AND L5D VERNIER JETS, AND RESULTING IN LOSS OF VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 1998

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J4-7 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO VERNIER JETS R5R AND R5D MANIFOLD DRIVER POWER CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER COMSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 1999 ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J4-7 TYPE II

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER TO VERNIER MANIFOLD R5 DRIVER POWER CIRCUIT. LOSS OF R5R AND R5D VERNIER JETS, AND RESULTING IN LOSS OF VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2000

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J6-K TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO VERNIER JETS R5R AND R5D MANIFOLD DRIVER POWER CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER COMSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2001

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J6-K TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER TO VERNIER MANIFOLD R5 DRIVER POWER CIRCUIT. LOSS OF R5R AND R5D VERNIER JETS, AND RESULTING IN LOSS OF VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2002 ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J6-X TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
POWER SUPPLIED TO VERNIER JETS R5R AND R5D MANIFOLD DRIVER POWER CIRCUIT. MAY CAUSE SOME ADDITIONAL POWER COMSUMPTION. IF MANIFOLD DRIVER OR LOGIC POWER FAILS ON, THE CREW CAN PREVENT JETS FROM FIRING BY INHIBITING THE JETS ON THE MANIFOLD, OR BY CLOSING THE APPROPRIATE ISOLATION VALVE.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2003 ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J6-X TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER TO VERNIER MANIFOLD R5 DRIVER POWER CIRCUIT. LOSS OF R5R AND R5D VERNIER JETS, AND RESULTING IN LOSS OF VERNIER RCS.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2004

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15F8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2005

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15F6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2006

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/3

ITEM: FUSE, 2A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/2/4, RJDA
5) FUSE, 2A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14F9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NOT ABLE TO SWITCH RJDA BUS A POWER. LOSS OF 1 OF 2 PWR SOURCES TO MANIFOLDS 1, 2, AND 4 DRIVER POWER CIRCUIT. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF A MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs AND PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. ABORT CRITICALITY IS 3/3 SINCE THE POWER LATCHING RELAY WAS SWITCH TO "ON" PRIOR TO LIFTOFF (OPS-9). AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2007 ABORT: 3/3

ITEM: FUSE, 2A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/3, RJDA
5) FUSE, 2A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15F7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NOT ABLE TO SWITCH RJDA BUS B POWER. LOSS OF 1 OF 2 PWR SOURCES TO MANIFOLDS 1 AND 3 DRIVER POWER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF A MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs AND PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. ABORT CRITICALITY IS 3/3 SINCE THE POWER LATCHING RELAY WAS SWITCHED TO "ON" PRIOR TO LIFTOFF (OPS-9). AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2008

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15F4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 LOGIC POWER SOURCES TO MANIFOLDS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. IF BOTH LOGIC POWER INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WOULD INHIBIT DUMPING SUFFICIENT TRAPPED PROPELLANT WEIGHT TO SATISFY LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2009 ABORT: 3/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15F5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 LOGIC POWER SOURCES TO MANIFOLDS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. IF BOTH LOGIC POWER INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WOULD INHIBIT DUMPING SUFFICIENT TRAPPED PROPELLANT WEIGHT TO SATISFY LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2010 ABORT: 2/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14F4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2011 ABORT: 3/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14F2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2012

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14F3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2013

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14F1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2014

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/3

ITEM: FUSE, 2A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2/3/4, RJDA
5) FUSE, 2A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/2R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16F5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NOT ABLE TO SWITCH RJDA BUS C POWER. LOSS OF 1 OF 2 PWR SOURCES TO MANIFOLDS 2, 3, AND 4 DRIVER POWER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF A MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. ABORT CRITICALITY IS 3/3 SINCE THE POWER LATCHING RELAY WAS SWITCHED TO "ON" PRIOR TO LIFTOFF (OPS-9). AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2015 ABORT: 2/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16F4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2016

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/5R, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16F3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2017 ABORT: 3/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16F2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 LOGIC POWER SOURCES TO MANIFOLDS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. IF BOTH LOGIC POWER INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WOULD INHIBIT DUMPING SUFFICIENT TRAPPED PROPELLANT WEIGHT TO SATISFY LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES. ONORBIT. THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2018

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16F1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 LOGIC POWER SOURCES TO MANIFOLDS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. IF BOTH LOGIC POWER INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WOULD INHIBIT DUMPING SUFFICIENT TRAPPED PROPELLANT WEIGHT TO SATISFY LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES. ONORBIT. THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROP OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2019

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 2/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S6
PART NUMBER: 33V73A14F8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2020

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PNL O14 S5
PART NUMBER: 33V73A14F6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2021 ABORT: 2/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S6
PART NUMBER: 33V73A14F7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD DRIVERS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2022

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S5
PART NUMBER: 33V73A14F5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF 1 OF 2 POWER SOURCES TO MANIFOLD LOGIC AND DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2023 ABORT: 2/1R

ITEM: LATCHING RELAY, RJDA BUS A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/2/4, RJDA
5) LATCHING RELAY, RJDA BUS A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131 LATCHING RELAY K1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LATCHING RELAY FAILING OPEN WILL REMOVE 1 OF 2 REDUNDANT POWER SOURCES FROM FWD MANIFOLDS 1, 2, AND 4 DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF AN AFT MANIFOLD (6 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2024 ABORT: 3/3

ITEM: LATCHING RELAY, RJDA BUS A
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/2/4, RJDA
5) LATCHING RELAY, RJDA BUS A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131 LATCHING RELAY K1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LATCHING RELAY FAILING CLOSED, WILL APPLY MN-A POWER TO AFT MANIFOLDS 1, 2, AND 4 DRIVER CIRCUITS. NO EFFECT, SINCE POWER CAN STILL BE CONTROLLED BY THE CORRESPONDING MANIFOLD DRIVER SWITCHES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2025 ABORT: 2/1R

ITEM: LATCHING RELAY, RJDA BUS B
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/3, RJDA
5) LATCHING RELAY, RJDA BUS B
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132 LATCHING RELAY K2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LATCHING RELAY FAILING OPEN WILL REMOVE 1 OF 2 REDUNDANT POWER SOURCES FROM AFT MANIFOLDS 1 AND 3 DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF AN AFT MANIFOLD (6 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2026

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: LATCHING RELAY, RJDA BUS B
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/3, RJDA
5) LATCHING RELAY, RJDA BUS B
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132 LATCHING RELAY K2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LATCHING RELAY FAILING CLOSED, WILL APPLY MN-B POWER TO AFT MANIFOLDS 1 AND 3 DRIVER CIRCUITS. NO EFFECT, SINCE POWER CAN STILL BE CONTROLLED BY THE CORRESPONDING MANIFOLD DRIVER SWITCHES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2027 ABORT: 2/1R

ITEM: LATCHING RELAY, RJDA BUS C
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2/3/4, RJDA
5) LATCHING RELAY, RJDA BUS C
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133 LATCHING RELAY K2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LATCHING RELAY FAILING OPEN WILL REMOVE 1 OF 2 REDUNDANT POWER SOURCES FROM AFT MANIFOLDS 2, 3, AND 4 DRIVER CIRCUITS. OTHER MANIFOLD JETS ARE ALSO AVAILABLE FOR ATTITUDE CONTROL. DURING ENTRY, LOSS OF THE MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF AN AFT MANIFOLD (6 PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2028

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: LATCHING RELAY, RJDA BUS C
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2/3/4, RJDA
5) LATCHING RELAY, RJDA BUS C
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133 LATCHING RELAY K2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LATCHING RELAY FAILING CLOSED, WILL APPLY MN-C POWER TO AFT MANIFOLDS 2, 3, AND 4 DRIVER CIRCUITS. NO EFFECT, SINCE POWER CAN STILL BE CONTROLLED BY THE CORRESPONDING MANIFOLD DRIVER SWITCHES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2029 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121R J4-106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2030

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121R J4-106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2031 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2032

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R17

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2033 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2034

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R18

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2035 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2036

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [. .] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2037 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT;	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2038

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2039 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/2/4, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2040

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/2/4, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2041 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/3, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 56V76A132A1R15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2042 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/3, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 56V76A132A1R15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2043 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2044

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2045 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2046

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2047 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [.] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2048

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2049 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2050

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2051 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2052

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R21

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2053 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2054

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R22

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2055 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2056

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2057 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2058

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R19

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2059 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2060

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1/L5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R20

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2061

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2062

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR REMOVES CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2063 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2064

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R36

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2065 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R37

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2066

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R37

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2067 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R38

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2068

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R38

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2069 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R39

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2070

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R39

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2071 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [· ·]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121R J4-104

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2072 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121R J4-104

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2073 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2074

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR REMOVES CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2075 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2076

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2077 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2078

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2079 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2080

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2081 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2082

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2083 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2084

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2085 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R32

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2086

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R32

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2087 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2/3/4, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2088

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2/3/4, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R16

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2089 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J4-106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2090

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J4-106

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2091 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R46

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2092

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R46

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2093 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2094 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [··] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2095 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2096 ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2097 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2098

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2099 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2100

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2101 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2102

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R7

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2103 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2104

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R8

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2105

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2106 ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] .. B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR OR DIODE REMOVES THE CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. IF BOTH LOGIC PWR INPUTS AND LATCHING SIGNALS FAIL OFF, LOSS OF MANIFOLD LOGIC POWER AND DRIVER POWER WOULD RESULT FOR BOTH VERNIER AND PRIMARY. DURING ENTRY, THE LOSS OF THE MANIFOLD WOULD AFFECT ENTRY DTOs AND PTIs. ONORBIT, THE LOSS OF THE VERNIER JET MANIFOLD WOULD RESULT IN THE LOSS OF VERNIER JETS. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2107 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R50

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2108

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [. .]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R50

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2109 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R51

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2110

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R51

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2111 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R48

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2112

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R48

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2113 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R49

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2114 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3/R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R49

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2115 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2116

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R1

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR REMOVES CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2117 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2118 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R14

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2119 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2120

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R15

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2121 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2122 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2123

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2124

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2125 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R141

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2126

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [.] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R141

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2127 ABORT: 3/3

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF CURRENT LIMITING TO RPC. EXPECT NO PROBLEM WITH RPC OPERATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2128 ABORT: 3/1R

ITEM: RESISTOR, 1.2K 2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.2K 2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OPEN RESISTOR REMOVES CAPABILITY OF THE DRIVER POWER LATCHING ON THE LOGIC POWER. DURING ENTRY, LOSS OF THIS MANIFOLD WILL AFFECT ANY SCHEDULED ENTRY DTOs OR PTIs. DURING RTLS, THE LOSS OF A MANIFOLD (SIX PRIMARY JETS) WILL CAUSE THE INABILITY TO EXPEL ENOUGH PROPELLANT TO MEET THE TANK LANDING CONSTRAINTS AND CG SAFETY BOUNDARIES DUE TO THE TRAPPED PROPELLANT WEIGHT. AFFECTS PRI JET ONORBIT OPERATIONS (RNDZ, PROX OPS). AFFECTS ABORT PROP DUMP LENGTH (TAL, AOA, ATO).

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2129 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2130

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2131 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R45

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2132

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R45

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2133 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R40

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2134

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R40

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2135 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2136

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R41

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2137 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2138 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2139 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R43

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2140

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, PCA 3
PART NUMBER: 56V76A133A1R43

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2141 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R43

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2142 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R43

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2143

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2144 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, PCA 1
PART NUMBER: 54V76A131A1R42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2145 ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF POWER ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2146

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 1.8K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) RESISTOR, 1.8K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R47

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THE MDM WILL SEE AN ERRONEOUS "ON" SIGNAL WHEN RPC IS OFF. THE BLEED RESISTOR NORMALLY SHUNTS LEAKAGE CURRENT TO GROUND AND PREVENTS ERRONEOUS VOLTAGE READING TO MDM WITH INPUT CIRCUIT OFF.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2147 ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R48

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/87
SUBSYSTEM: ARCS
MDAC ID: 2148

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 2.2K 1/2W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) RESISTOR, 2.2K 1/2W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, PCA 2
PART NUMBER: 55V76A132A1R48

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2149 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122R J2-11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOSS OF PWR ON INDICATION TO OA INSTRUMENTATION.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2150

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: R.A. O'DONNELL SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD R5, RJDA
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122R J2-11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
OA MDM SHOULD RESPOND TO PWR ON/OFF CYCLES.

REFERENCES: VS70-943099 REV B EO B12, JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2151 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED BY PLACING THE L1/L5/R1 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. POWER CAN BE REMOVED FROM RJDA BUS A AND B ONLY BY REMOVING POWER FROM MAIN BUS A AND B. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE MANIFOLD, WHICH WILL AFFECT ONORBIT OPERATIONS, AND POWER TO RJDA BUS A AND B.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2152 ABORT: 1/1

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED FOR POWER TO RJDA BUS A AND B BY THE L4/R4 AND L3/R5/L3 MANIFOLD DRIVER SWITCHES, RESPECTIVELY. THERE IS NO REDUNDANCY FOR LOSS OF DRIVER POWER. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DIRVER POWER TO THE MANIFOLD AND POWER TO RJDA BUS B AND C, AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2153 ABORT: 2/1R

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER OPEN CONTACTS OF THE SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L1/L5/R1 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2154 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L1/L5/R1 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM MANIFOLD L1/ 5/R1 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2155 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2156 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH
CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2157 ABORT: 3/1R

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L3/R5/R3 MANIFOLD DRIVER SWITCH AND THE LATCHING BUS POWER RELAY. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS B AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2158 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
POWER CAN BE REMOVED FROM RJDA BUS B BY REMOVING POWER FROM MAIN BUS B. FAILURE OF ALL REDUNDANCY WILL RESULT IN INABILITY TO REMOVE POWER FROM RJDA BUS B.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2159 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE THE INABILITY TO REMOVE BUS B POWER FROM RJDA BUS B DUE TO THE LATCHING BUS POWER RELAY.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2160 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY TO OPEN THE POWER PATH THROUGH CONTACT SET 7, 8 TO RJDA BUS B IS PROVIDED BY THE L3/R5/R3 MANIFOLD DRIVER SWITCH. REDUNDANCY TO PREVENT REMOVAL OF RJDA BUS B POWER IS ALSO PROVIDED BY THE ON POSITIONS OF THE L1/L5/R1 AND THE L3/R5/R3 MANIFOLD DRIVER SWITCHES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS B.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2161 ABORT: 2/1R

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER OPEN CONTACTS OF THE SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L1/L5/R1 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2162

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L1/L5/R1 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM MANIFOLD L1/ 5/R1 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2163 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2164 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2165 ABORT: 3/1R

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L2/R2 AND THE L4/R4 MANIFOLD DRIVER SWITCHES AND THE LATCHING BUS POWER RELAY. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS A AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2166 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
POWER CAN BE REMOVED FROM RJDA BUS A BY REMOVING POWER FROM MAIN BUS A. FAILURE OF ALL REDUNDANCY WILL RESULT IN INABILITY TO REMOVE POWER FROM RJDA BUS A.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2167 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE THE INABILITY TO REMOVE BUS A POWER FROM RJDA BUS A DUE TO THE LATCHING BUS POWER RELAY.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2168 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S4
PART NUMBER: 33V73A15S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY TO OPEN THE POWER PATH THROUGH CONTACT SET 15, 16 TO RJDA BUS A IS PROVIDED BY THE L2/R2 AND THE L4/R4 MANIFOLD DRIVER SWITCHES. REDUNDANCY TO PREVENT REMOVAL OF RJDA BUS A POWER IS ALSO PROVIDED BY THE ON POSITIONS OF THE L1/L5/R1, THE L4/R4, AND THE L2/R2 MANIFOLD DRIVER SWITCHES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS A.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2169 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOGIC POWER CAN BE REMOVED BY REMOVING POWER TO CONTROL BUSSES AB1 AND AB2. DRIVER POWER CAN BE REMOVED FORM THE MANIFOLD BY PLACING THE L1/L5/R1 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L1/L5/R1, AND WILL AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2170 ABORT: 1/1

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF LOGIC POWER TO THE L1/L5/R1 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOS AND PTIS, AND ABORT DUMP LENGTHS. FAILURE DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2171 ABORT: 2/1R

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER ON SWITCH CONTACTS. FAILURE RESULTS IN THE LOSS OF LOGIC AND DRIVER POWER TO THE L1/L5/R1 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2172 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L1/L5/R1 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L1/L5/R1 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2173 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2174 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2175 ABORT: 3/1R

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L3/R5/R3 MANIFOLD DRIVER SWITCH AND THE LATCHING BUS POWER RELAY. FAILURE RESULTS IN THE LOSS OF LOGIC AND DRIVER POWER TO THE L1/L5/R1 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs.
FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2176 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L1/L5/R1 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L1/L5/R1 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2177 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2178 ABORT: 3/3

ITEM: RJDA1B L1/L5/R1 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/L5/R1, RJDA1B
5) RJDA1B L1/L5/R1 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O15 S3
PART NUMBER: 33V73A15S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2179 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED BY PLACING THE L2/R2 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. POWER CAN BE REMOVED FROM RJDA BUS A AND C ONLY BY REWMOVING POWER FROM MAIN BUS A AND C. FAILURE OF ALL REDUNDANCY WILL CASE THE INABILITY TO REMOVE DRIVER POWER FROM THE MANIFOLD, WHICH WILL AFFECT ONORBIT OPERATIONS, AND POWER TO RJDA BUS A AND C.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2180 ABORT: 1/1

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED FOR POWER TO RJDA BUS A BY THE L4/R4 AND L1/L5/L1 MANIFOLD DRIVER SWITCHES. REDUNDANCY FOR POWER TO RJDA BUS C IS PROVIDED BY TRHE L3/R5/R3 AND THE L4/R4 MANIFOLD DRIVER SWITCHES. THERE IS NO REDUNDANCY FOR THE DRIVER POWER. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND POWER TO RJDA BUS B AND C, AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOS AND PTIS, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2181 ABORT: 2/1R

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER OPEN CONTACTS OF THE SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L2/R2 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2182 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L2/R2 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM MANIFOLD L2/R2 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2183 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2184 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2185 ABORT: 3/1R

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE LD1/L5/R1 AND THE L4/R4 MANIFOLD DRIVER SWITCHES AND THE LATCHING BUS POWER RELAY. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS A AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2186 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
POWER CAN BE REMOVED FROM RJDA BUS A BY REMOVING POWER FROM MAIN BUS A. FAILURE OF ALL REDUNDANCY WILL RESULT IN INABILITY TO REMOVE POWER FROM RJDA BUS A.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2187 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE THE INABILITY TO REMOVE BUS A POWER FROM RJDA BUS A DUE TO THE LATCHING BUS POWER RELAY.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

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INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2188 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY TO OPEN THE POWER PATH THROUGH CONTACT SET 7, 8 TO RJDA BUS A IS PROVIDED BY THE L4/R4 AND THE L1/L5/R1 MANIFOLD DRIVER SWITCHES. REDUNDANCY TO PREVENT REMOVAL OF RJDA BUS A POWER IS ALSO PROVIDED BY THE ON POSITIONS OF THE L1/L5/R1, THE L4/R4, AND THE L2/R2 MANIFOLD DRIVER SWITCHES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS A.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2189 ABORT: 2/1R

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER OPEN CONTACTS OF THE SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L2/R2 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2190 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L2/R2 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM MANIFOLD L2/R2 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2191 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2192 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2193 ABORT: 3/1R

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L3/R5/R3 AND THE L4/R4 MANIFOLD DRIVER SWITCHES AND THE LATCHING BUS POWER RELAY. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS C AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2194 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
POWER CAN BE REMOVED FROM RJDA BUS C BY REMOVING POWER FROM MAIN BUS C. FAILURE OF ALL REDUNDANCY WILL RESULT IN INABILITY TO REMOVE POWER FROM RJDA BUS C.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2195 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE THE INABILITY TO REMOVE BUS C POWER FROM RJDA BUS C DUE TO THE LATCHING BUS POWER RELAY.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2196 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S4
PART NUMBER: 33V73A14S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY TO OPEN THE POWER PATH THROUGH CONTACT SET 15, 16 TO RJDA BUS C IS PROVIDED BY THE L4/R4 AND THE L3/R5/R3 MANIFOLD DRIVER SWITCHES. REDUNDANCY TO PREVENT REMOVAL OF RJDA BUS C POWER IS ALSO PROVIDED BY THE ON POSITIONS OF THE L2/R2, THE L4/R4, AND THE L3/R5/R3 MANIVOLD DRIVER SWITCHES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS C.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2197 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOGIC POWER CAN BE REMOVED BY REMOVING POWER TO CONTROL BUSSES CA1 AND CA2. DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L2/R2 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L2/R2, AND MAY AFFECT ONORBIT OPERATIONS..

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2198 ABORT: 1/1

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF LOGIC POWER TO THE L2/R2 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2199 ABORT: 2/1R

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER ON SWITCH CONTACTS. FAILURE RESULTS IN THE LOSS OF LOGIC AND DRIVER POWER TO THE L2/R2 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2200 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L2/R2 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L4/R4 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2201 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2202 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2203 ABORT: 3/1R

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L1/L5/R1 AND THE L4/R4 MANIFOLD DRIVER SWITCHES AND THE LATCHING BUS POWER RELAY. FAILURE RESULTS IN THE LOSS OF LOGIC AND DRIVER POWER TO THE L2/R2 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2204 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L2/R2 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L4/R4 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2205 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2206 ABORT: 3/3

ITEM: RJDA1A L2/R2 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A L2/R2 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O14 S3
PART NUMBER: 33V73A14S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2207 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED BY PLACING THE L3/R5/R3 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. POWER CAN BE REMOVED FROM RJDA BUS B AND C ONLY BY REMOVING POWER FROM MAIN BUS B AND C. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE MANIFOLD, WHICH WILL AFFECT ONORBIT OPERATIONS, AND POWER TO RJDA BUS B AND C.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2208 ABORT: 1/1

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED FOR POWER TO RJDA BUS B BY THE L1/L5/L1 MANIFOLD DRIVER SWITCH. REDUNDANCY FOR POWER TO RJDA BUS C PROVIDED BY THE L2/R2 AND THE L4/R4 MANIFOLD DRIVER SWITCHES. THERE IS NO REDUNDANCY LOSS OF DRIVER POWER. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND POWER TO RJDA BUS B AND C, AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2209 ABORT: 2/1R

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER OPEN CONTACTS OF THE SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L3/R5/R3 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2210 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L3/R5/R3 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE L3/R5/R3 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2211 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2212

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH
CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2213 ABORT: 3/1R

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L1/L5/R1 MANIFOLD DRIVER SWITCH AND THE LATCHING BUS POWER RELAY. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS B AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2214 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
POWER CAN BE REMOVED FROM RJDA BUS B BY REMOVING POWER FROM MAIN BUS B. FAILURE OF ALL REDUNDANCY WILL RESULT IN INABILITY TO REMOVE POWER FROM RJDA B.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2215 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE THE INABILITY TO REMOVE BUS B POWER FROM RJDA BUS B DUE TO THE LATCHING BUS POWER RELAY.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2216 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY TO OPEN THE POWER PATH THROUGH CONTACT SET 7, 8 TO RJDA BUS B IS PROVIDED BY THE L1/L5/R1 MANIFOLD DRIVER SWITCH. REDUNDANCY TO PREVENT REMOVAL OF RJDA BUS B POWER IS ALSO PROVIDED BY THE ON POSITIONS OF THE L1/L5/R1 AND THE L3/R5/R3 MANIFOLD DRIVER SWITCHES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS B.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2217 ABORT: 2/1R

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER OPEN CONTACTS OF THE SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L3/R5/R3 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2218 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L3/R5/R3 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE L3/R5/R3 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2219 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2220 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2221 ABORT: 3/1R

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L2/R2 AND THE L4/R4 MANIFOLD DRIVER SWITCHES AND THE LATCHING BUS POWER RELAY. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS C AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2222 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
POWER CAN BE REMOVED FROM RJDA BUS C BY REMOVING POWER FROM MAIN BUS C. FAILURE OF ALL REDUNDANCY WILL RESULT IN INABILITY TO REMOVE POWER FROM RJDA B.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2223 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE THE INABILITY TO REMOVE BUS C POWER FROM RJDA BUS C DUE TO THE LATCHING BUS POWER RELAY.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2224 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S4
PART NUMBER: 33V73A16S4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY TO OPEN THE POWER PATH THROUGH CONTACT SET 15, 16 TO RJDA BUS C IS PROVIDED BY THE L2/R2 AND THE L4/R4 MANIFOLD DRIVER SWITCHES. REDUNDANCY TO PREVENT REMOVAL OF RJDA BUS C POWER IS ALSO PROVIDED BY THE ON POSITIONS OF THE L2/R2, THE L4/R4, AND THE L3/R5/R3 MANIFOLD DRIVER SWITCHES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS C.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2225 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOGIC POWER CAN BE REMOVED BY REMOVING POWER TO CONTROL BUSSES BC1 AND BC2. DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L3/R5/R3 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L3/R5/R3, AND WILL AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2226 ABORT: 1/1

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF LOGIC POWER TO THE L3/R5/R3 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ANOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2227 ABORT: 2/1R

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY OTHER ON SWITCH CONTACTS. FAILURE RESULTS IN THE LOSS OF LOGIC AND DRIVER POWER TO THE L3/R5/R3 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2228 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L3/R5/L3 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L3/R5/R3 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2229 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2230

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2231 ABORT: 3/1R

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L1/L5/R1 MANIFOLD DRIVER SWITCH AND THE LATCHING BUS POWER RELAY. FAILURE RESULTS IN THE LOSS OF LOGIC AND DRIVER POWER TO THE L3/R5/R3 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2232 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L3/R5/L3 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND MANIFOLD POWER FROM MANIFOLD L3/R5/R3 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2233 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2234 ABORT: 3/3

ITEM: RJDA2B L3/R3/R5 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B L3/R3/R5 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S3
PART NUMBER: 33V73A16S3

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2235 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED BY PLACING THE L4/R4 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. POWER CAN BE REMOVED FROM RJDA BUS A AND C ONLY BY REMOVING POWER FROM MAIN BUS A NAD C. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM THE MANIFOLD, WHICH WILL AFFECT ONORBIT OPERATIONS, AND POWER TO RJDA BUS A AND C.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2236 ABORT: 1/1

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED FOR POWER TO RJDA BUS A AND B BY THE L2/R2 AND L1/L5/L1 MANIFOLD DRIVER SWITCH. REDUNDANCY FOR POWER TO RJDA BUS C PROVIDED BY THE L2/R2 AND THE L3/R5/R3 MANIFOLD DRIVER SWITCHES. THERE IS NO REDUNDANCY FOR LOSS OF DRIVER POWER. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE MANIFOLD AND POWER TO RJDA BUS A AND C, AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2237 ABORT: 2/1R

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER OPEN CONTACTS OF THE SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L4/R4 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2238 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L4/R4 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM MANIFOLD L4/R4 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2239 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2240 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2241 ABORT: 3/1R

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L3/R5/R3 AND THE L4/R4 MANIFOLD DRIVER SWITCHES AND THE LATCHING BUS POWER RELAY. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS C AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2242 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
POWER CAN BE REMOVED FROM RJDA BUS C BY REMOVING POWER FROM MAIN BUS C. FAILURE OF ALL REDUNDANCY WILL RESULT IN INABILITY TO REMOVE POWER FROM RJDA BUS C.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2243

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE THE INABILITY TO REMOVE BUS C POWER FROM RJDA BUS C DUE TO THE LATCHING BUS POWER RELAY.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2244 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY TO OPEN THE POWER PATH THROUGH CONTACT SET 7, 8 TO RJDA BUS A IS PROVIDED BY THE L2/R2 AND THE L3/R5/R3 MANIFOLD DRIVER SWITCHES. REDUNDANCY TO PREVENT REMOVAL OV RJDA BUS C POWER IS ALSO PROVIDED BY THE L2/RS, THE L4/R4, AND THE L3/R5/R3 MANIVOLD DRIVER SWITCHES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS C.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2245 ABORT: 2/1R

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/3	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE OTHER OPEN CONTACTS OF THE SWITCH. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF DRIVER POWER TO THE L4/R4 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2246 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 9, 10
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L4/R4 MANIFOLD LOGIC SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE DRIVER POWER FROM MANIFOLD L4/R4 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2247 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2248 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 11, 12
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2249 ABORT: 3/1R

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L1/L5/R1 AND THE L2/R2 MANIFOLD DRIVER SWITCHES AND THE LATCHING BUS POWER RELAY. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS A AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE OF ALL REDUNDANCY DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2250 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER ON SWITCH CONTACTS 13, 14
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
POWER CAN BE REMOVED FROM RJDA BUS A BY REMOVING POWER FROM MAIN BUS A. FAILURE OF ALL REDUNDANCY WILL RESULT IN INABILITY TO REMOVE POWER FROM RJDA BUS A.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2251 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE THE INABILITY TO REMOVE BUS A POWER FROM RJDA BUS A DUE TO THE LATCHING BUS POWER RELAY.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2252 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD DRIVER OFF SWITCH CONTACTS 15, 16
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S6
PART NUMBER: 33V73A14S6

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY TO OPEN THE POWER PATH THROUGH CONTACT SET 15, 16 TO RJDA BUS A IS PROVIDED BY THE L2/R2 AND THE4 L1/L5/R1 MANIFOLD DRIVER SWITCHES. REDUNDANCY TO PREVENT REMOVAL OF RJDA BUS A POWER IS ALSO PROVIDED BY THE ON POSITIONS OF THE L1/L5/R1, THE L2/R2, AND THE L4/R4 MANIFOLD DRIVER SWITCHES. FAILURE OF ALL REDUNDANCY WILL RESULT IN THE LOSS OF POWER TO RJDA BUS A.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2253 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
LOGIC POWER CAN BE REMOVED BY REMOVING POWER TO CONTROL BUSSES CA2 AND CA3. DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L4/R4 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L4/R4, AND WILL AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2254

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 1/1

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	2/2
ONORBIT:	2/2	AOA:	2/2
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF LOGIC POWER TO THE L4/R4 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS, ENTRY DTOs AND PTIs, AND ABORT DUMP LENGTHS. FAILURE DURING RTLS WILL CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2255 ABORT: 2/1R

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY OTHER ON SWITCH CONTACTS. FAILURE RESULTS IN THE LOSS OF LOGIC AND DRIVER POWER TO THE L4/R4 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs. FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2256 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC ON SWITCH CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L4/R4 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L4/R4 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2257 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87
SUBSYSTEM: ARCS
MDAC ID: 2258

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC OFF SWITCH CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2259 ABORT: 3/1R

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THE L2/R2 AND THE L3/R5/R3 MANIFOLD DRIVER SWITCHES AND THE LATCHING BUS POWER RELAY. FAILURE RESULTS IN THE LOSS OF LOGIC AND DRIVER POWER TO THE L4/R4 MANIFOLD AND MAY AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs.
FAILURE OF ALL REDUNDANCY DURING RTLS MAY CAUSE LOSS OF VEHICLE DUE TO INABILITY TO EXPEL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2260 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
FAILURE MODE: SWITCH ON CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC ON SWITCH CONTACTS 5, 6
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
DRIVER POWER CAN BE REMOVED FROM THE MANIFOLD BY PLACING THE L4/R4 MANIFOLD DRIVER SWITCH IN THE CLOSED POSITION. FAILURE OF ALL REDUNDANCY WILL CAUSE THE INABILITY TO REMOVE LOGIC AND DRIVER POWER FROM MANIFOLD L4/R4 AND MAY AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2261 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2262 ABORT: 3/3

ITEM: RJDA2A L4/R4 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
FAILURE MODE: SWITCH OFF CONTACTS FAIL CLOSED (SHORTED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) CONTROLS
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A L4/R4 MANIFOLD LOGIC OFF SWITCH CONTACTS 7, 8
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL O16 S5
PART NUMBER: 33V73A14S5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THE OFF CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099 REV B EO B12, CP; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK, PG 11.10, RCS SIG 2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2263 ABORT: 3/3

ITEM: RJDA1B MANIFOLD L1/R1/L5 TRICKLE TEST
FAILURE MODE: TEST DOES NOT OPERATE OR OPERATES ERRATICALLY.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD L1/R1/L5, RJDA1B
5) RJDA1B MANIFOLD L1/R1/L5 TRICKLE TEST
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD
PART NUMBER: MANIFOLD L1/R1/L5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW AND GROUND CANNOT DETERMINE THE OPERATIONAL STATUS OF THE AFT RCS JETS. ENTRY MAY BE DELAYED SO THAT A HOT FIRE TEST CAN BE DONE ON CRITICAL JETS.

REFERENCES: VS70-943099 REV B EO B12, CJ

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2264 ABORT: 3/3

ITEM: RJDA1A MANIFOLD L2/R2 TRICKLE TEST
FAILURE MODE: TEST DOES NOT OPERATE OR OPERATES ERRATICALLY.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD L2/R2, RJDA1A
5) RJDA1A MANIFOLD L2/R2 TRICKLE TEST
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD
PART NUMBER: MANIFOLD L2/R2

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW AND GROUND CANNOT DETERMINE THE OPERATIONAL STATUS OF THE AFT RCS JETS. ENTRY MAY BE DELAYED SO THAT A HOT FIRE TEST CAN BE DONE ON CRITICAL JETS.

REFERENCES: VS70-943099 REV B EO B12, CJ

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2265 ABORT: 3/3

ITEM: RJDA2B MANIFOLD L3/R3/R5 TRICKLE TEST
FAILURE MODE: TEST DOES NOT OPERATE OR OPERATES ERRATICALLY.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD L3/R3/R5, RJDA2B
5) RJDA2B MANIFOLD L3/R3/R5 TRICKLE TEST
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD
PART NUMBER: MANIFOLD L3/R3/R5

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW AND GROUND CANNOT DETERMINE THE OPERATIONAL STATUS OF THE AFT RCS JETS. ENTRY MAY BE DELAYED SO THAT A HOT FIRE TEST CAN BE DONE ON CRITICAL JETS.

REFERENCES: VS70-943099 REV B EO B12, CJ

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2266 ABORT: 3/3

ITEM: RJDA2A MANIFOLD L4/R4 TRICKLE TEST
FAILURE MODE: TEST DOES NOT OPERATE OR OPERATES ERRATICALLY.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD L4/R4, RJDA2A
5) RJDA2A MANIFOLD L4/R4 TRICKLE TEST
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD
PART NUMBER: MANIFOLD L4/R4

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW AND GROUND CANNOT DETERMINE THE OPERATIONAL STATUS OF THE AFT RCS JETS. ENTRY MAY BE DELAYED SO THAT A HOT FIRE TEST CAN BE DONE ON CRITICAL JETS.

REFERENCES: VS70-943099 REV B EO B12, CJ

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2267

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RCS ACTIVITY LIGHTS
FAILURE MODE: LIGHTS FAIL OFF OR ON.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) RCS ACTIVITY LIGHTS
5) RCS ACTIVITY LIGHTS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD
PART NUMBER: ALL MANIFOLDS

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW HAS NO VISUAL INDICATION WHAT AXIS AND DIRECTIONS JETS ARE FIRING IN OR IF THE ELEVON DRIVE RATE IS SATURATED.

REFERENCES: VS70-943099 REV B EO B12, CJ

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2268 ABORT: 3/3

ITEM: L/R OX OR FU MANIFOLD 1 PRESS SENSOR
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU
5) L/R OX OR FU MANIFOLD 1 PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT210, 51V42PT209; 52V42PT310, 52V42PT309

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF THE MANIFOLD TEMPERATURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2269

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX OR FU MANIFOLD 1 PRESS SENSOR
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, L/R OX & FU
5) L/R OX OR FU MANIFOLD 1 PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT210, 51V42PT209; 52V42PT310, 52V42PT309

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF THE MANIFOLD TEMPERATURE SENSOR WILL CAUSE CREW AND GROUND DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2270 ABORT: 3/3

ITEM: L/R OX OR FU MANIFOLD 2 PRESS SENSOR
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU
5) L/R OX OR FU MANIFOLD 2 PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT212, 51V42PT217; 52V42PT312, 52V42PT317

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2271

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX OR FU MANIFOLD 2 PRESS SENSOR
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 2, L/R OX & FU
5) L/R OX OR FU MANIFOLD 2 PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT212, 51V42PT217; 52V42PT312, 52V42PT317

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2272

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX OR FU MANIFOLD 3 PRESS SENSOR
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU
5) L/R OX OR FU MANIFOLD 3 PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [· ·] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT219, 51V42PT214; 52V42PT319, 52V42PT314

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2273 ABORT: 3/3

ITEM: L/R OX OR FU MANIFOLD 3 PRESS SENSOR
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 3, L/R OX & FU
5) L/R OX OR FU MANIFOLD 3 PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT219, 51V42PT214; 52V42PT319, 52V42PT314

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2274

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX OR FU MANIFOLD 4 PRESS SENSOR
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU
5) L/R OX OR FU MANIFOLD 4 PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT216, 51V42PT221; 52V42PT316, 52V42PT321

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2275 ABORT: 3/3

ITEM: L/R OX OR FU MANIFOLD 4 PRESS SENSOR
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 4, L/R OX & FU
5) L/R OX OR FU MANIFOLD 4 PRESS SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42PT216, 51V42PT221; 52V42PT316, 52V42PT321

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2276

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX MANIFOLD 1 TEMP SENSOR
FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, L/R OX
5) L/R OX MANIFOLD 1 TEMP SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42TT208; 52V42TT308

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF THE MANIFOLD PRESSURE SENSOR WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2277

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX MANIFOLD 1 TEMP SENSOR
FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 1, L/R OX
5) L/R OX MANIFOLD 1 TEMP SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42TT208; 52V42TT308

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE OF THE MANIFOLD PRESSURE SENSOR WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2278

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX MANIFOLD 5 TEMP SENSOR
FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 5, L/R OX
5) L/R OX MANIFOLD 5 TEMP SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42TT2XX; 52V42TT3XX

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2279

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R OX MANIFOLD 5 TEMP SENSOR
FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) MANIFOLD 5, L/R OX
5) L/R OX MANIFOLD 5 TEMP SENSOR
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42TT2XX; 52V42TT3XX

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
FAILURE WILL CAUSE GROUND AND CREW DIFFICULTY IN DETERMINING A LEAKING MANIFOLD. CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2280 ABORT: 3/3

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1A, L3A, R1A, R3A
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, AFT
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1A, L3A, R1A, R3A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1A, 51V42ENL3A; 52V42ENR1A, 52V42ENR3A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2281

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1A, L3A, R1A, R3A
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, AFT
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1A, L3A, R1A, R3A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1A, 51V42ENL3A; 52V42ENR1A, 52V42ENR3A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2282 ABORT: 3/1R

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1A, L3A, R1A, R3A
FAILURE MODE: FAILS ON, INDICATING A PRESSURE HIGHER THAN THE CHAMBER PRESSURE DETECTION LEVEL IN THE RJD.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, AFT
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1A, L3A, R1A, R3A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1A, 51V42ENL3A; 52V42ENR1A, 52V42ENR3A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL ANNOUNCE THE JET AS FAILED ON, BUT WILL NOT DESELECT THE JET.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2283

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1L, 51V42ENL2L, 51V42ENL3L, 51V42EN L4L; 52V42ENR1L, 52V42ENR2L, 52V42ENR3L, 52V42ENR4L

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2284 ABORT: 3/1R

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1L, 51V42ENL2L, 51V42ENL3L, 51V42EN L4L; 52V42ENR1L, 52V42ENR2L, 52V42ENR3L, 52V42ENR4L

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2285

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
FAILURE MODE: FAILS ON, INDICATING A PRESSURE HIGHER THAN THE CHAMBER PRESSURE DETECTION LEVEL IN THE RJD.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1L, 51V42ENL2L, 51V42ENL3L, 51V42EN L4L; 52V42ENR1L, 52V42ENR2L, 52V42ENR3L, 52V42ENR4L

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2286 ABORT: 3/3

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L5L, L5D, R5R, R5D
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L5L, L5D, R5R, R5D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL5L, 51V42ENL5D, 51V42ENR5R, 51V42ENR5D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2287

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L5L, L5D, R5R, R5D
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L5L, L5D, R5R, R5D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL5L, 51V42ENL5D, 51V42ENR5R, 51V42ENR5D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2288 ABORT: 3/1R

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L5L, L5D, R5R, R5D
FAILURE MODE: FAILS ON, INDICATING A PRESSURE HIGHER THAN THE CHAMBER PRESSURE DETECTION LEVEL IN THE RJD.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L5L, L5D, R5R, R5D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL5L, 51V42ENL5D, 51V42ENR5R, 51V42ENR5D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2289

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
FAILURE MODE: INDICATES HIGHER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, UP/DOWN
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1U, 51V42ENL2U, 51V42ENL4U, 51V42ENL2D, 51V42ENL3D, 51V42ENL4D; 52V42ENR1U, 52V42ENR2U, 52V42ENR4U, 52V42ENR2D, 52V42ENR3D, 52V42ENR4D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2290 ABORT: 3/1R

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
FAILURE MODE: INDICATES LOWER PRESSURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, UP/DOWN
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1U, 51V42ENL2U, 51V42ENL4U, 51V42ENL2D, 51V42ENL3D, 51V42ENL4D; 52V42ENR1U, 52V42ENR2U, 52V42ENR4U, 52V42ENR2D, 52V42ENR3D, 52V42ENR4D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87
SUBSYSTEM: ARCS
MDAC ID: 2291

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
FAILURE MODE: FAILS ON, INDICATING A PRESSURE HIGHER THAN THE CHAMBER PRESSURE DETECTION LEVEL IN THE RJD.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, UP/DOWN
5) L/R CHAMBER PRESSURE (Pc) SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1U, 51V42ENL2U, 51V42ENL4U, 51V42ENL2D, 51V42ENL3D, 51V42ENL4D; 52V42ENR1U, 52V42ENR2U, 52V42ENR4U, 52V42ENR2D, 52V42ENR3D, 52V42ENR4D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2292 ABORT: 3/3

ITEM: L/R OX OR FU INJECTOR TEMP SENSOR THRUSTER L1A, L3A, R1A, R3A
FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, AFT
5) L/R OX OR FU INJECTOR TEMP SENSOR THRUSTER L1A, L3A, R1A, R3A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1A, 51V42ENL3A, 52V42ENR1A, 52V42ENR3A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2293 ABORT: 3/1R

ITEM: L/R OX OR FU INJECTOR TEMP SENSOR THRUSTER L1A, L3A, R1A, R3A
FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, AFT
5) L/R OX OR FU INJECTOR TEMP SENSOR THRUSTER L1A, L3A, R1A, R3A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1A, 51V42ENL3A, 52V42ENR1A, 52V42ENR3A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2294 ABORT: 3/3

ITEM: L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1L, 51V42ENL2L, 51V42ENL3L, 51V42ENL4L, 52V42ENR1R, 52V42ENR2R, 52V42ENR3R, 52V42ENR4R

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2295 ABORT: 3/1R

ITEM: L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L1L, L2L, L3L, L4L, R1R, R2R, R3R, R4R
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1L, 51V42ENL2L, 51V42ENL3L, 51V42ENL4L, 52V42ENR1R, 52V42ENR2R, 52V42ENR3R, 52V42ENR4R

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2296 ABORT: 3/3

ITEM: L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L5L, L5D, R5R, R5D
FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L5L, L5D, R5R, R5D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL5L, 51V42ENL5D, 51V42ENR5R, 51V42ENR5D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/2R
MDAC ID: 2297 ABORT: 3/3

ITEM: L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L5L, L5D, R5R, R5D
FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, L/R
5) L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L5L, L5D, R5R, R5D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/2R	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL5L, 51V42ENL5D, 51V42ENR5R, 51V42ENR5D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2298 ABORT: 3/3

ITEM: L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
FAILURE MODE: INDICATES HIGHER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, UP/DOWN
5) L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1U, 51V42ENL2U, 51V42ENL4U, 51V42ENL2D, 51V42ENL3D, 51V42ENL4D, 52V42ENR1U, 52V42ENR2U, 52V42ENR4U, 52V42ENR2D, 52V42ENR3D, 52V42ENR4D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW MAY MAKE BAD DECISION BASED ON ERRONEOUS DATA.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2299 ABORT: 3/1R

ITEM: L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
FAILURE MODE: INDICATES LOWER TEMPERATURE THAN ACTUAL.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) INSTRUMENTATION
3) THRUSTER SUBSYSTEM
4) THRUSTERS, UP/DOWN
5) L/R OX OR FU INJECTOR TEMP SENSOR, THRUSTERS L1U, L2U, L4U, L2D, L3D, L4D, R1U, R2U, R4U, R2D, R3D, R4D
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/2R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS MANIFOLDS AND THRUSTERS
PART NUMBER: 51V42ENL1U, 51V42ENL2U, 51V42ENL4U, 51V42ENL2D, 51V42ENL3D, 51V42ENL4D, 52V42ENR1U, 52V42ENR2U, 52V42ENR4U, 52V42ENR2D, 52V42ENR3D, 52V42ENR4D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY MANAGEMENT WILL DESELECT THE JET AND ANNOUNCE IT AS FAILED OFF.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2300 ABORT: 1/1

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J11-F; J11-G

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
EFFECTS ARE THE SAME AS "OX & FU MANIF 1 ISOL" VALVES FAIL TO OPEN CASE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2301

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122AR J11-F; J11-G

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
OPERATION OF THERMOSTAT IN EACH JET ASSEMBLY WILL PREVENT OVERHEATING OF PROPELLANT. CREW CAN REMOVE POWER FROM THE HEATER SWITCHES. OVERHEATING OF PROPELLANTS COULD CAUSE ZOTS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2302 ABORT: 1/1

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J11-H; J11-I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
EFFECTS ARE THE SAME AS "OX & FU MANIF 2 ISOL" VALVES FAIL TO OPEN CASE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2303 ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121AR J11-H; J11-I

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
OPERATION OF THERMOSTAT IN EACH JET ASSEMBLY WILL PREVENT OVERHEATING OF PROPELLANT. CREW CAN REMOVE POWER FROM THE HEATER SWITCHES. OVERHEATING OF PROPELLANTS COULD CAUSE ZOTS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2304

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 1/1

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J11-F; AR J11-G

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
EFFECTS ARE THE SAME AS "OX & FU MANIF 3 ISOL" VALVES FAIL TO OPEN CASE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2305

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J11-F; AR J11-G

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
OPERATION OF THERMOSTAT IN EACH JET ASSEMBLY WILL PREVENT OVERHEATING OF PROPELLANT. CREW CAN REMOVE POWER FROM THE HEATER SWITCHES. OVERHEATING OF PROPELLANTS COULD CAUSE ZOTS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2306 ABORT: 1/1

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/2R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J11-H TYPE III; AR J11-I (181) TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
EFFECTS ARE THE SAME AS "OX & FU MANIF 4 ISOL" VALVES FAIL TO OPEN CASE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2307 ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J11-H TYPE III; AR J11-I (181) TYPE III

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
OPERATION OF THERMOSTAT IN EACH JET ASSEMBLY WILL PREVENT OVERHEATING OF PROPELLANT. CREW CAN REMOVE POWER FROM THE HEATER SWITCHES. OVERHEATING OF PROPELLANTS COULD CAUSE ZOTS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2308

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 2/2

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J8-73

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT OR RIGHT MANIFOLD 5. VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2309

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: DRIVER, HYBRID
FAILURE MODE: FAILS HIGH

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) DRIVER, HYBRID
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123AR J8-73

CAUSES: CONTAMINATION, VIBRATION, PIECE PART FAILURE, OVERLOAD

EFFECTS/RATIONALE:
OPERATION OF THERMOSTAT IN EACH JET ASSEMBLY WILL PREVENT OVERHEATING OF PROPELLANT. CREW CAN REMOVE POWER FROM THE HEATER SWITCHES. OVERHEATING OF PROPELLANTS COULD CAUSE ZOTS. VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2310

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 1/1

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S9
PART NUMBER: 36V73A14F27

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
EFFECTS ARE THE SAME AS "OX & FU MANIF 1 ISOL" VALVES FAIL TO OPEN CASE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2311 ABORT: 1/1

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S10
PART NUMBER: 36V73A14F28

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
EFFECTS ARE THE SAME AS "OX & FU MANIF 2 ISOL" VALVES FAIL TO OPEN CASE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2312

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 1/1

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S11
PART NUMBER: 36V73A14F29

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
EFFECTS ARE THE SAME AS "OX & FU MANIF 3 ISOL" VALVES FAIL TO OPEN CASE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2313

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 1/1

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S12
PART NUMBER: 36V73A14F30

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
EFFECTS ARE THE SAME AS "OX & FU MANIF 4 ISOL" VALVES FAIL TO OPEN CASE.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2314

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: FUSE, 1A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) FUSE, 1A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S13
PART NUMBER: 36V73A14F31

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD 5. VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2315

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: FUSE, 5A
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) FUSE, 5A
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123F

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT OR RIGHT MANIFOLD 5. VERNIER THRUSTERS ARE NOT USED DURING ENTRY OR ABORTS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2316 ABORT: 3/3

ITEM: HEATER 30W, THRUSTER, PRIMARY, +X AXIS
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) PRIMARY MANIFOLD JETS
5) HEATER 30W, THRUSTER, PRIMARY, +X AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS THRUSTERS
PART NUMBER: 51V42ENL1A, L3A; 52V42ENR1A, R3A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE MAY AFFECT ONORBIT OPERATIONS AND FAILURE OF ALL RCS DEORBIT CAPABILITY. PROPELLANT WILL NOT FREEZE IN JETS DURING ABORTS DUE TO LACK OF TIME.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2317 ABORT: 3/3

ITEM: HEATER 20W, THRUSTER, PRIMARY, Y AXIS
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) PRIMARY MANIFOLD JETS
5) HEATER 20W, THRUSTER, PRIMARY, Y AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS THRUSTERS
PART NUMBER: 51V42ENL1L, L2L, L3L, L4L; 52V42ENR1R, R2R, R3R, R4R

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE MAY AFFECT ONORBIT OPERATIONS AND FAILURE OF ALL REDUNDANCY DURING ENTRY MAY CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES. PROPELLANTS WILL NOT FREEZE IN JETS DURING ABORTS DUE TO LACK OF TIME.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2318 ABORT: 3/3

ITEM: HEATER 20W, THRUSTER, PRIMARY, Z AXIS
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) PRIMARY MANIFOLD JETS
5) HEATER 20W, THRUSTER, PRIMARY, Z AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS THRUSTERS
PART NUMBER: 51V42ENL1U, L2U, L2U, L2D, L3D, L4D; 52V42ENR1U, R2U, R4U, R2D, R3D, R4D;

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE MAY AFFECT ONORBIT OPERATIONS AND FAILURE OF ALL REDUNDANCY DURING ENTRY MAY CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES. PROPELLANTS WILL NOT FREEZE IN JETS DURING ABORTS DUE TO LACK OF TIME.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2319

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: HEATER 30W, THRUSTER, PRIMARY, +X AXIS
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) PRIMARY MANIFOLD JETS
5) HEATER 30W, THRUSTER, PRIMARY, +X AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS THRUSTERS
PART NUMBER: 51V42ENL1A, L3A; 52V42ENR1A, R3A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE MAY AFFECT ONORBIT OPERATIONS AND WILL AFFECT THE +X JET RCS DEORBIT CAPABILITY. PROPELLANT WILL NOT FREEZE IN JETS DURING ABORTS DUE TO LACK OF TIME.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2320 ABORT: 3/3

ITEM: HEATER 20W, THRUSTER, PRIMARY, Y AXIS
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) PRIMARY MANIFOLD JETS
5) HEATER 20W, THRUSTER, PRIMARY, Y AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS THRUSTERS
PART NUMBER: 51V42ENL1L, L2L, L3L, L4L; 52V42ENR1R, R2R, R3R, R4R

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE MAY AFFECT ONORBIT OPERATIONS AND FAILURE OF ALL REDUNDANCY DURING ENTRY MAY CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES. PROPELLANTS WILL NOT FREEZE IN JETS DURING ABORTS DUE TO LACK OF TIME.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2321 ABORT: 3/3

ITEM: HEATER 20W, THRUSTER, PRIMARY, Z AXIS
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) PRIMARY MANIFOLD JETS
5) HEATER 20W, THRUSTER, PRIMARY, Z AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS THRUSTERS
PART NUMBER: 51V42ENL1U, L2U, L2U, L2D, L3D, L4D; 52V42ENR1U, R2U, R4U, R2D, R3D, R4D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE MAY AFFECT ONORBIT OPERATIONS AND FAILURE OF ALL REDUNDANCY DURING ENTRY MAY CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES. PROPELLANTS WILL NOT FREEZE IN JETS DURING ABORTS DUE TO LACK OF TIME.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2322 ABORT: 3/3

ITEM: HEATER 10W, THRUSTER, VERNIER, ALL AXES
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) VERNIER MANIFOLD JETS
5) HEATER 10W, THRUSTER, VERNIER, ALL AXES
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS THRUSTERS
PART NUMBER: 51V42ENL5D; 51V42ENL5L; 52V42ENR5D; 52V42ENR5R

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THERE IS NO REDUNDANCY FOR VERNIER JETS. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE WILL AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2323

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: HEATER 10W, THRUSTER, VERNIER, ALL AXES
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) VERNIER MANIFOLD JETS
5) HEATER 10W, THRUSTER, VERNIER, ALL AXES
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS THRUSTERS
PART NUMBER: 51V42ENL5D; 51V42ENL5L; 52V42ENR5D; 52V42ENR5R

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THERE IS NO REDUNDANCY FOR VERNIER JETS. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE WILL AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2324

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122R J4-43

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
GROUND AND CREW CANNOT DETERMINE IF "AFT MANIFOLD 1 JETS HEATER CONTROL SWITCH" IS WORKING, EXCEPT BY MONITORING THRUSTER TEMPERATURES. THERE ARE NO TALKBACKS ASSOCIATED WITH THIS SWITCH.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2325 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 5, LCA 2
PART NUMBER: 55V76A122R J4-43

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2326

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121R J4-42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
GROUND AND CREW CANNOT DETERMINE IF "AFT MANIFOLD 2 JETS HEATER CONTROL SWITCH" IS WORKING, EXCEPT BY MONITORING THRUSTER TEMPERATURES. THERE ARE NO TALKBACKS ASSOCIATED WITH THIS SWITCH.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2327 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 4, LCA 1
PART NUMBER: 54V76A121R J4-42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2328

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J4-43

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
GROUND AND CREW CANNOT DETERMINE IF "AFT MANIFOLD 3 JETS HEATER CONTROL SWITCH" IS WORKING, EXCEPT BY MONITORING THRUSTER TEMPERATURES. THERE ARE NO TALKBACKS ASSOCIATED WITH THIS SWITCH.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2329

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J4-43

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2330 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J4-42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
GROUND AND CREW CANNOT DETERMINE IF "AFT MANIFOLD 4 JETS HEATER CONTROL SWITCH" IS WORKING, EXCEPT BY MONITORING THRUSTER TEMPERATURES. THERE ARE NO TALKBACKS ASSOCIATED WITH THIS SWITCH.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2331

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J4-42

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2332 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J4-44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
GROUND AND CREW CANNOT DETERMINE IF "AFT MANIFOLD 5 JETS HEATER CONTROL SWITCH" IS WORKING, EXCEPT BY MONITORING THRUSTER TEMPERATURES. THERE ARE NO TALKBACKS ASSOCIATED WITH THIS SWITCH.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2333 ABORT: 3/3

ITEM: RESISTOR, 5.1K 1/4W
FAILURE MODE: FAILS SHORT

LEAD ANALYST: W.A. HAUFLER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) RESISTOR, 5.1K 1/4W
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AV BAY 6, LCA 3
PART NUMBER: 56V76A123R J4-44

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NO EFFECT. TALKBACK IS STILL AVAILABLE TO GPC.

REFERENCES: VS70-943099 REV B EO B12; JSC 11174, SPACE SHUTTLE SYSTEMS HANDBOOK

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2334

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: THERMOSTAT, PRIMARY THRUSTERS, +X AXIS
FAILURE MODE: FAILS TO CLOSE (FAILS OPEN).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) THRUSTERS, PRIMARY, +X AXIS
5) THERMOSTAT, PRIMARY THRUSTERS, +X AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS THRUSTER ASSEMBLIES
PART NUMBER: 51V42ENL1A, L3A; R1A, R3A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE MAY AFFECT ONORBIT OPERATIONS AND WILL AFFECT THE +X JET RCS DEORBIT CAPABILITY. PROPELLANT WILL NOT FREEZE IN JETS DURING ABORTS DUE TO LACK OF TIME.

REFERENCES: VS70-943099, REV B EO B12; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/1R
MDAC ID: 2335 ABORT: 2/1R

ITEM: THERMOSTAT, PRIMARY THRUSTERS, +X AXIS
FAILURE MODE: FAILS TO OPEN (FAILS CLOSED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) THRUSTERS, PRIMARY, +X AXIS
5) THERMOSTAT, PRIMARY THRUSTERS, +X AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: L/R OMS POD, RCS THRUSTER ASSEMBLIES
PART NUMBER: 51V42ENL1A, L3A; R1A, R3A

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW CAN REMOVE POWER FROM THE HEATER SWITCHES, BUT C&W DOES NOT ANNUNCIATE THE HIGH TEMPERATURE CONDITION. OVERHEATING OF PROPELLANTS COULD CAUSE ZOTS, LEADING TO LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JET IS USED.

REFERENCES: VS70-943099, REV B EO B12; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2336

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: THERMOSTAT, PRIMARY THRUSTERS, Y AXIS
FAILURE MODE: FAILS TO CLOSE (FAILS OPEN).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) THRUSTERS, PRIMARY, Y AXIS
5) THERMOSTAT, PRIMARY THRUSTERS, Y AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS THRUSTER ASSEMBLIES
PART NUMBER: 51V42ENL1L, L2L, L3L, L4L; R1R, R2R, R3R, R4R

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE MAY AFFECT ONORBIT OPERATIONS AND FAILURE OF ALL REDUNDANCY DURING ENTRY MAY CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES. PROPELLANTS WILL NOT FREEZE IN JETS DURING ABORTS DUE TO LACK OF TIME.

REFERENCES: VS70-943099, REV B EO B12; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2337

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: THERMOSTAT, PRIMARY THRUSTERS, Y AXIS
FAILURE MODE: FAILS TO OPEN (FAILS CLOSED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) THRUSTERS, PRIMARY, Y AXIS
5) THERMOSTAT, PRIMARY THRUSTERS, Y AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: L/R OMS POD, RCS THRUSTER ASSEMBLIES
PART NUMBER: 51V42ENL1L, L2L, L3L, L4L; R1R, R2R, R3R, R4R

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW CAN REMOVE POWER FROM THE HEATER SWITCHES, BUT C&W DOES NOT ANNUNCIATE THE HIGH TEMPERATURE CONDITION. OVERHEATING OF PROPELLANTS COULD CAUSE ZOTS, LEADING TO LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JET IS USED.

REFERENCES: VS70-943099, REV B EO B12; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2338 ABORT: 3/3

ITEM: THERMOSTAT, PRIMARY THRUSTERS, Z AXIS
FAILURE MODE: FAILS TO CLOSE (FAILS OPEN).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) THRUSTERS, PRIMARY, Z AXIS
5) THERMOSTAT, PRIMARY THRUSTERS, Z AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/2R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: L/R OMS POD, RCS THRUSTER ASSEMBLIES
PART NUMBER: 51V42ENL1U, L2U, L4U, L2D, L3D, L4D; R1U, R2U, R4U, R2D, R3D, R4D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THRUSTERS WHICH FIRE IN THE SAME DIRECTION. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE MAY AFFECT ONORBIT OPERATIONS AND FAILURE OF ALL REDUNDANCY DURING ENTRY MAY CAUSE LOSS OF VEHICLE DUE TO THE INABILITY TO EXPELL ENOUGH PROPELLANTS TO MEET THE TANK LANDING WEIGHT CONSTRAINTS AND/OR THE CG SAFETY BOUNDARIES. PROPELLANTS WILL NOT FREEZE IN JETS DURING ABORTS DUE TO LACK OF TIME.

REFERENCES: VS70-943099, REV B EO B12; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/1R
MDAC ID: 2339 ABORT: 2/1R

ITEM: THERMOSTAT, PRIMARY THRUSTERS, Z AXIS
FAILURE MODE: FAILS TO OPEN (FAILS CLOSED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) THRUSTERS, PRIMARY, Z AXIS
5) THERMOSTAT, PRIMARY THRUSTERS, Z AXIS
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: L/R OMS POD, RCS THRUSTER ASSEMBLIES
PART NUMBER: 51V42ENL1U, L2U, L4U, L2D, L3D, L4D; R1U, R2U, R4U, R2D, R3D, R4D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW CAN REMOVE POWER FROM THE HEATER SWITCHES, BUT C&W DOES NOT ANNUNCIATE THE HIGH TEMPERATURE CONDITION. OVERHEATING OF PROPELLANTS COULD CAUSE ZOTS, LEADING TO LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JET IS USED.

REFERENCES: VS70-943099, REV B EO B12; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	1/23/87	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	ARCS	FLIGHT:	2/2
MDAC ID:	2340	ABORT:	3/3

ITEM: THERMOSTAT, VERNIER THRUSTERS, ALL AXES
FAILURE MODE: FAILS TO CLOSE (FAILS OPEN).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) THRUSTERS, VERNIER, ALL AXES
5) THERMOSTAT, VERNIER THRUSTERS, ALL AXES
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: L/R OMS POD, RCS THRUSTER ASSEMBLIES
PART NUMBER: 51V42ENL5D; R5D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
THERE IS NO REDUNDANCY FOR VERNIER JETS. PROPELLANT IN THIS JET WILL FREEZE ONORBIT. IF JET'S TEMPERATURE DROPS BELOW LIMITS, THE RM WILL DESELECT THIS JET. FAILURE WILL AFFECT ONORBIT OPERATIONS.

REFERENCES: VS70-943099, REV B EO B12; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2341

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: THERMOSTAT, VERNIER THRUSTERS, ALL AXES
FAILURE MODE: FAILS TO OPEN (FAILS CLOSED).

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) THRUSTERS, VERNIER, ALL AXES
5) THERMOSTAT, VERNIER THRUSTERS, ALL AXES
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: L/R OMS POD, RCS THRUSTER ASSEMBLIES
PART NUMBER: 51V42ENL5D; R5D

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
CREW CAN REMOVE POWER FROM THE HEATER SWITCHES, BUT C&W DOES NOT ANNUNCIATE THE HIGH TEMPERATURE CONDITION. OVERHEATING OF PROPELLANTS COULD CAUSE ZOTS, LEADING TO LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JET IS USED.

REFERENCES: VS70-943099, REV B EO B12; FLIGHT RULE 6-95

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2342 ABORT: 3/1R

ITEM: MANIFOLD 1, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) MANIFOLD 1, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S9
PART NUMBER: 36V73A14S9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2343

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: MANIFOLD 1, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) MANIFOLD 1, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S9
PART NUMBER: 36V73A14S9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2344

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: MANIFOLD 1, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) MANIFOLD 1, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S9
PART NUMBER: 36V73A14S9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND R5IGHT MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2345 ABORT: 3/1R

ITEM: MANIFOLD 1, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) MANIFOLD 1, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S9
PART NUMBER: 36V73A14S9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2346

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: MANIFOLD 1, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) MANIFOLD 1, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S9
PART NUMBER: 36V73A14S9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2347 ABORT: 3/3

ITEM: MANIFOLD 1, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 1 JETS
5) MANIFOLD 1, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S9
PART NUMBER: 36V73A14S9

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2348

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) MANIFOLD 2, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S10
PART NUMBER: 36V73A14S10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2349 ABORT: 3/3

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) MANIFOLD 2, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S10
PART NUMBER: 36V73A14S10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MAIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2350

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) MANIFOLD 2, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S10
PART NUMBER: 36V73A14S10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND ENTRY DTOS AND PTIS.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2351 ABORT: 3/1R

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) MANIFOLD 2, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S10
PART NUMBER: 36V73A14S10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2352

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) MANIFOLD 2, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S10
PART NUMBER: 36V73A14S10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2353 ABORT: 3/3

ITEM: MANIFOLD 2, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 2 JETS
5) MANIFOLD 2, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S10
PART NUMBER: 36V73A14S10

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2354 ABORT: 3/1R

ITEM: MANIFOLD 3, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) MANIFOLD 3, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S11
PART NUMBER: 36V73A14S11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	1/23/87	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	ARCS	FLIGHT:	2/2
MDAC ID:	2355	ABORT:	3/3

ITEM: MANIFOLD 3, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) MANIFOLD 3, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S11
PART NUMBER: 36V73A14S11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2356

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: MANIFOLD 3, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) MANIFOLD 3, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S11
PART NUMBER: 36V73A14S11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND ENTRY DTOs AND PTIs.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2357 ABORT: 3/1R

ITEM: MANIFOLD 3, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) MANIFOLD 3, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S11
PART NUMBER: 36V73A14S11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2358

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: MANIFOLD 3, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) MANIFOLD 3, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S11
PART NUMBER: 36V73A14S11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2359 ABORT: 3/3

ITEM: MANIFOLD 3, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 3 JETS
5) MANIFOLD 3, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S11
PART NUMBER: 36V73A14S11

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2360

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MANIFOLD 4, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) MANIFOLD 4, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S12
PART NUMBER: 36V73A14S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2361

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: 3/3

ITEM: MANIFOLD 4, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) MANIFOLD 4, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S12
PART NUMBER: 36V73A14S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS ENTRY DETOS AND PTIS.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2362 ABORT: 3/3

ITEM: MANIFOLD 4, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) MANIFOLD 4, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	2/2	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S12
PART NUMBER: 36V73A14S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD. THIS COULD AFFECT ONORBIT OPERATIONS AND ENTRY DTOS AND PTIS.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2363 ABORT: 3/1R

ITEM: MANIFOLD 4, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH OPEN CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) MANIFOLD 4, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S12
PART NUMBER: 36V73A14S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS. THIS COULD RESULT IN LOSS OF VEHICLE IN ANY FLIGHT PHASE IN WHICH THE JETS ARE USED.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2364 ABORT: 3/3

ITEM: MANIFOLD 4, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) MANIFOLD 4, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S12
PART NUMBER: 36V73A14S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2365 ABORT: 3/3

ITEM: MANIFOLD 4, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 4 JETS
5) MANIFOLD 4, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S12
PART NUMBER: 36V73A14S12

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2366 ABORT: 3/3

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE ON POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) MANIFOLD 5, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/1R	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S13
PART NUMBER: 36V73A14S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2367 ABORT: 3/3

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH
FAILURE MODE: SWITCH FAILS IN THE OFF POSITION.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) MANIFOLD 5, JETS HEATER CONTROL SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S13
PART NUMBER: 36V73A14S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 2/2
MDAC ID: 2368 ABORT: 3/3

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) MANIFOLD 5, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S13
PART NUMBER: 36V73A14S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
PROPELLANT IN JETS WILL FREEZE. THIS WILL CAUSE LOSS OF ALL JETS ON THE LEFT AND RIGHT MANIFOLD.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/1R
MDAC ID: 2369 ABORT: 3/3

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
FAILURE MODE: SWITCH CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) MANIFOLD 5, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/1R	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PNL A14 S13
PART NUMBER: 36V73A14S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
REDUNDANCY PROVIDED BY THERMOSTATS IN EACH JET ASSEMBLY AND BY CIRCUIT BREAKERS. FAILURE OF ALL REDUNDANCY COULD CAUSE OVERHEATING OF PROPELLANTS, RESULTING IN ZOTS.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: ARCS FLIGHT: 3/3
MDAC ID: 2370 ABORT: 3/3

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL OPEN.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) MANIFOLD 5, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S13
PART NUMBER: 36V73A14S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/23/87
SUBSYSTEM: ARCS
MDAC ID: 2371

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: MANIFOLD 5, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
FAILURE MODE: SWITCH CONTACTS FAIL CLOSED.

LEAD ANALYST: V.J. BURKEMPER SUBSYS LEAD: D.J. PAUL

BREAKDOWN HIERARCHY:
1) ELECTRICAL COMPONENTS
2) THRUSTER
3) THERMAL CONTROL SUBSYSTEM
4) MANIFOLD 5 JETS
5) MANIFOLD 5, JETS HEATER CONTROL SWITCH OPEN CONTACTS 3, 4
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PNL A14 S13
PART NUMBER: 36V73A14S13

CAUSES: CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL SHOCK, OVERLOAD

EFFECTS/RATIONALE:
NONE, THESE CONTACTS ARE NOT IN A CIRCUIT.

REFERENCES: VS70-943099, REV B EO B12, DL, CL

APPENDIX D
POTENTIAL CRITICAL ITEMS

MDAC ID	ITEM	FAILURE MODE
100	HELIUM STORAGE TANK	STRUCTURAL FAILURE (RUPTURE OR LEAK)
101	HELIUM FILL COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS
104	HE ISOL A & B VLVS	FAILS TO OPEN (FAILS CLOSED)
105	HE LINE, ALL EXCEPT ISOL VLV TO PRESS REGULATOR	STRUCTURAL FAILURE (RUPTURE OR LEAK)
106	HE LINE, ALL EXCEPT ISOL VLV TO PRESS REGULATOR	RESTRICTED FLOW
107	HE LINE, ISOL VLV TO PRESS REGULATOR	STRUCTURAL FAILURE (RUPTURE OR LEAK)
108	HE LINE, ISOL VLV TO PRESS REGULATOR	RESTRICTED FLOW
112	HE PRESS REGULATOR ASSEMBLY	FAILS CLOSED
113	HE PRESS REGULATOR ASSEMBLY	RESTRICTED FLOW
114	HE PRESS REGULATOR ASSEMBLY	LEAKS EXTERNALLY
115	HE PRESS REGULATOR PRIMARY SENSING PORT	LEAKS EXTERNALLY
116	HE PRESS REGULATOR PRIMARY SENSING PORT	FAILS TO OPEN (FAILS CLOSED)
117	HE PRESS REGULATOR OUTLET TEST PORT COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS
119	QUAD CHECK VALVE ASSEMBLY	FAILS TO CLOSE (FAILS OPEN) OR LEAKS (REVERSE FLOW)
120	QUAD CHECK VALVE ASSEMBLY	FAILS TO OPEN (FAILS CLOSED)
121	QUAD CHECK VALVE TEST PORT COUPLINGS A & B	FAILS TO CLOSE (FAILS OPEN), OR LEAKS
123	PROPELLANT TANK	STRUCTURAL FAILURE (RUPTURE OR LEAK)
124	PROP LINES, ALL	STRUCTURAL FAILURE (RUPTURE OR LEAK)
125	PROP LINES, ALL	RESTRICTED FLOW
126	PROP FILL VENT REGULATOR CHECKOUT COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
128	PROP CHANNEL SCREENS	STRUCTURAL FAILURE (RUPTURE)
129	PROP FEEDOUT TUBE	RESTRICTED FLOW
130	PROP TK UPPER COMPARTMENT CHANNEL CHECKOUT COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
132	PROP TK LOWER COMPARTMENT CHANNEL BLEED COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
134	PROP TK LOWER COMPARTMENT BULKHEAD BLEED COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
136	PROP TK VENT AND REGULATOR CHECKOUT COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
138	GIMBAL BELLOWS	STRUCTURAL FAILURE (RUPTURE OR LEAK)

MDAC ID	ITEM	FAILURE MODE
139	GIMBAL BELLOWS	RESTRICTED FLOW
140	PRESSURE RELIEF ASSEMBLY	BURST DISK RUPTURES AT LOW PRESSURE, OR LEAKS
141	PRESSURE RELIEF ASSEMBLY	BURST DISK FAILS TO RUPTURE, RUPTURES AT A HIGHER THAN NOMINAL PRESSURE, OR POPPET VALVE FAIL
145	GROUND MANUAL ISOLATION VALVE	FAILS TO REMAIN OPEN (FAILS CLOSED)
146	GROUND MANUAL ISOLATION VALVE	LEAKS EXTERNALLY
147	PROP TK ISOL VLVS 1/2 & 3/4/5	LEAKS EXTERNALLY
148	PROP TK ISOL VLVS 1/2 & 3/4/5	RESTRICTED FLOW
150	PROP TK ISOL VLV 1/2	FAILS TO OPEN (FAILS CLOSED)
152	PROP TK ISOL VLV 3/4/5	FAILS TO OPEN (FAILS CLOSED)
153	MANIFOLD 1/2 FILL & DRAIN/PURGE COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
155	MANIFOLD 3/4/5 FILL & DRAIN/PURGE COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
158	MANIFOLD 1, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)
159	MANIFOLD 1, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
162	MANIFOLD 2, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)
163	MANIFOLD 2, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
166	MANIFOLD 3, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)
167	MANIFOLD 3, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
170	MANIFOLD 4, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)
171	MANIFOLD 4, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
174	MANIFOLD 5, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)
175	MANIFOLD 5, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
177	MANIFOLD ISOL VLVS	LEAKS EXTERNALLY
178	MANIFOLD ISOL VLVS	RESTRICTED FLOW
179	JET ALIGNMENT BELLOWS, PRIMARY, ALL AXES	STRUCTURAL FAILURE (RUPTURE OR LEAK)
180	JET ALIGNMENT BELLOWS, PRIMARY, ALL AXES	RESTRICTED FLOW
181	THRUSTER BIPROP SOLENOID VLV, PRIMARY, ALL AXES	FAILS TO CLOSE (FAILS OPEN/ON)
182	THRUSTER BIPROP SOLENOID VLV, PRIMARY, ALL AXES	LEAKS EXTERNALLY, ONE PROPELLANT
183	THRUSTER BIPROP SOLENOID VLV, PRIMARY, ALL AXIS	RESTRICTED FLOW
185	THRUSTER BIPROP SOLENOID VLV, PRIMARY, -X AXIS	LEAKS INTERNALLY, ONE PROPELLANT
186	THRUSTER BIPROP SOLENOID VLV, PRIMARY, Y AXIS	FAILS TO OPEN (FAILS CLOSED)
187	THRUSTER BIPROP SOLENOID VLV, PRIMARY, Y AXIS	LEAKS INTERNALLY, ONE PROPELLANT

MDAC ID	ITEM	FAILURE MODE
189	THRUSTER BIPROP SOLENOID VLV, PRIMARY, Z AXIS	LEAKS INTERNALLY, ONE PROPELLANT
190	JET ALIGNMENT BELLOWS, VERNIER, ALL AXES	STRUCTURAL FAILURE (RUPTURE OR LEAK)
191	JET ALIGNMENT BELLOWS, VERNIER, ALL AXES	RESTRICTED FLOW
192	THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES	FAILS TO CLOSE (FAILS OPEN/ON)
193	THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES	FAILS TO OPEN (FAILS CLOSED)
194	THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES	LEAKS EXTERNALLY, ONE PROPELLANT
195	THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES	LEAKS INTERNALLY, ONE PROPELLANT
196	THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES	RESTRICTED FLOW
197	THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, PRIMARY, ALL AXES	THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION BURNTHROUGH
198	THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, VERNIER, ALL AXES	THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION BURNTHROUGH
199	HELIUM STORAGE TANK	STRUCTURAL FAILURE (RUPTURE OR LEAK)
200	HELIUM FILL COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS
203	HE ISOL A & B VLVS	FAILS TO OPEN (FAILS CLOSED)
204	HE LINE, ALL EXCEPT ISOL VLV TO PRESS REGULATOR	STRUCTURAL FAILURE (RUPTURE OR LEAK)
205	HE LINE, ALL EXCEPT ISOL VLV TO PRESS REGULATOR	RESTRICTED FLOW
206	HE LINE, ISOL VLV TO PRESS REGULATOR	STRUCTURAL FAILURE (RUPTURE OR LEAK)
207	HE LINE, ISOL VLV TO PRESS REGULATOR	RESTRICTED FLOW
211	HELIUM PRESSURE REGULATOR ASSEMBLY	FAILS CLOSED
212	HELIUM PRESSURE REGULATOR ASSEMBLY	RESTRICTED FLOW
213	HELIUM PRESSURE REGULATOR ASSEMBLY	LEAKS EXTERNALLY
214	HELIUM PRESSURE REGULATOR PRIMARY SENSING PORT	LEAKS EXTERNALLY
215	HELIUM PRESSURE REGULATOR PRIMARY SENSING PORT	FAILS TO OPEN (FAILS CLOSED)
216	HELIUM PRESSURE REGULATOR OUTLET TEST PORT COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS
218	QUAD CHECK VALVE ASSEMBLY	FAILS TO CLOSE (FAILS OPEN) OR LEAKS (REVERSE FLOW)

MDAC ID	ITEM	FAILURE MODE
219	QUAD CHECK VALVE ASSEMBLY	FAILS TO OPEN (FAILS CLOSED)
222	PROPELLANT TANK	STRUCTURAL FAILURE (RUPTURE OR LEAK)
223	PROP LINES, ALL	STRUCTURAL FAILURE (RUPTURE OR LEAK)
224	PROP LINES, ALL	RESTRICTED FLOW
225	PROP FILL/VENT COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
227	PROP CHANNEL SCREENS	STRUCTURAL FAILURE (RUPTURE)
228	PROP FEEDOUT TUBE	RESTRICTED FLOW
231	PROP TK LOWER COMPARTMENT CHANNEL BLEED COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
237	PROP TK ENTRY SUMP BLEED COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
239	GIMBAL BELLOWS	STRUCTURAL FAILURE (RUPTURE OR LEAK)
240	GIMBAL BELLOWS	RESTRICTED FLOW
241	PRESSURE RELIEF ASSEMBLY	BURST DISK RUPTURES AT LOW PRESSURE, OR LEAKS
242	PRESSURE RELIEF ASSEMBLY	BURST DISK FAILS TO RUPTURE, RUPTURES AT A HIGHER THAN NOMINAL PRESSURE, OR POPPET VALVE FAIL
246	GROUND MANUAL ISOLATION VALVE	FAILS TO REMAIN OPEN (FAILS CLOSED)
247	GROUND MANUAL ISOLATION VALVE	LEAKS EXTERNALLY
248	PROP TANK ISOL VLVS 1/2 & 3/4/5	LEAKS EXTERNALLY
249	PROP TANK ISOL VLVS 1/2 & 3/4/5	RESTRICTED FLOW
250	PROP TANK ISOL VLV 1/2	FAILS TO CLOSE (FAILS OPEN), OR LEAKS INTERNALLY
251	PROP TANK ISOL VLV 1/2	FAILS TO OPEN (FAILS CLOSED)
252	PROP TANK ISOL VLV 3/4/5/ A & B	FAILS TO CLOSE (FAILS OPEN), OR LEAKS INTERNALLY
254	MANIFOLD 1/2 GROUND PURGE COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
256	MANIFOLD 3/4/5 GROUND PURGE COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
258	RCS CROSSFEED VLV 1/2 OR 3/4/5	RESTRICTED FLOW
259	RCS CROSSFEED VLV 1/2 OR 3/4/5	LEAKS EXTERNALLY
260	RCS CROSSFEED VLV 1/2	FAILS TO CLOSE (FAILS OPEN), OR LEAKS INTERNALLY
261	RCS CROSSFEED VLV 1/2	FAILS TO OPEN (FAILS CLOSED)
262	RCS CROSSFEED VLV 3/4/5	FAILS TO CLOSE (FAILS OPEN), OR LEAKS INTERNALLY
263	RCS CROSSFEED VLV 3/4/5	FAILS TO OPEN (FAILS CLOSED)
264	CROSSFEED LINES	RESTRICTED FLOW
265	CROSSFEED LINES	STRUCTURAL FAILURE (RUPTURE OR LEAK)
267	MANIFOLD 1, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)

MDAC ID	ITEM	FAILURE MODE
268	MANIFOLD 1, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
271	MANIFOLD 2, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)
272	MANIFOLD 2, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
275	MANIFOLD 3, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)
276	MANIFOLD 3, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
279	MANIFOLD 4, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)
280	MANIFOLD 4, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
283	MANIFOLD 5, ISOL VLV	FAILS TO OPEN (FAILS CLOSED)
284	MANIFOLD 5, GROUND PURGE/DRAIN COUPLING	FAILS TO CLOSE (FAILS OPEN), OR LEAKS EXTERNALLY
286	MANIFOLD ISOL VLVS	LEAKS EXTERNALLY
287	MANIFOLD ISOL VLVS	RESTRICTED FLOW
288	JET ALIGNMENT BELLOWS, PRIMARY, ALL AXES	STRUCTURAL FAILURE (RUPTURE OR LEAK)
289	JET ALIGNMENT BELLOWS, PRIMARY, ALL AXES	RESTRICTED FLOW
290	THRUSTER BIPROP SOLENOID VLVS, PRIMARY, ALL AXES	FAILS TO CLOSE (FAILS OPEN/ON)
291	THRUSTER BIPROP SOLENOID VLVS, PRIMARY, ALL AXES	LEAKS EXTERNALLY, ONE PROPELLANT
292	THRUSTER BIPROP SOLENOID VLVS, PRIMARY, ALL AXES	RESTRICTED FLOW
294	THRUSTER BIPROP SOLENOID VLVS, PRIMARY, +X AXIS	LEAKS INTERNALLY, ONE PROPELLANT
296	THRUSTER BIPROP SOLENOID VLVS, PRIMARY, Y AXIS	LEAKS INTERNALLY, ONE PROPELLANT
298	THRUSTER BIPROP SOLENOID VLVS, PRIMARY, Z AXIS	LEAKS INTERNALLY, ONE PROPELLANT
299	JET ALIGNMENT BELLOWS, VERNIER, ALL AXES	STRUCTURAL FAILURE (RUPTURE OR LEAK)
300	JET ALIGNMENT BELLOWS, VERNIER, ALL AXES	RESTRICTED FLOW
301	THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES	FAILS TO CLOSE (FAILS OPEN/ON)
302	THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES	FAILS TO OPEN (FAILS CLOSED)
303	THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES	LEAKS EXTERNALLY, ONE PROPELLANT
304	THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES	LEAKS INTERNALLY, ONE PROPELLANT
305	THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES	RESTRICTED FLOW
306	THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, PRIMARY, ALL AXES	THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION BURNTHROUGH

MDAC ID	ITEM	FAILURE MODE
307	THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, VERNIER, ALL AXES	THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION BURNTHROUGH
308	CONTROLLER, REMOTE POWER	FAILS OPEN
311	CONTROLLER, REMOTE POWER	FAILS HIGH
312	CONTROLLER, REMOTE POWER	FAILS OPEN
316	DIODE	FAILS OPEN
317	DIODE	FAILS SHORT
318	DIODE	FAILS OPEN
319	DIODE	FAILS SHORT
320	DIODE	FAILS OPEN
321	DIODE	FAILS SHORT
322	DIODE	FAILS OPEN
323	DIODE	FAILS SHORT
329	DRIVER, HYBRID	FAILS HIGH
330	DRIVER, HYBRID	FAILS OPEN
332	DRIVER, HYBRID	FAILS OPEN
335	DRIVER, HYBRID	FAILS HIGH
337	DRIVER, HYBRID	FAILS HIGH
340	FUSE, 1A	FAILS OPEN
365	HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL OPEN
367	HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 7, 8	SWITCH OPEN CONTACTS FAIL OPEN
370	HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS 9, 10	SWITCH GPC CONTACTS FAIL CLOSED
371	HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL OPEN
372	HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL CLOSED
390	DIODE	FAILS OPEN
391	DIODE	FAILS SHORT
392	DIODE	FAILS OPEN
393	DIODE	FAILS SHORT
395	DIODE	FAILS SHORT
397	DIODE	FAILS SHORT
398	DIODE	FAILS OPEN
399	DIODE	FAILS SHORT
400	DIODE	FAILS OPEN
401	DIODE	FAILS SHORT
403	DIODE	FAILS SHORT
413	DIODE	FAILS SHORT
423	DIODE	FAILS SHORT
426	DIODE	FAILS OPEN
427	DIODE	FAILS SHORT
428	DIODE	FAILS OPEN
429	DIODE	FAILS SHORT
431	DIODE	FAILS SHORT
433	DIODE	FAILS SHORT
434	DIODE	FAILS OPEN
435	DIODE	FAILS SHORT

MDAC ID	ITEM	FAILURE MODE
436	DIODE	FAILS OPEN
437	DIODE	FAILS SHORT
439	DIODE	FAILS SHORT
449	DIODE	FAILS SHORT
459	DIODE	FAILS SHORT
472	RELAY	FAILS OPEN
475	RELAY	FAILS HIGH
477	RELAY	FAILS HIGH
478	RELAY	FAILS OPEN
481	RELAY	FAILS HIGH
483	RELAY	FAILS HIGH
484	RELAY	FAILS OPEN
487	RELAY	FAILS HIGH
489	RELAY	FAILS HIGH
490	RELAY	FAILS OPEN
493	RELAY	FAILS HIGH
495	RELAY	FAILS HIGH
535	OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
540	OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
546	OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL CLOSED
550	OX & FU TK ISOL VLV 3/4/5 SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
555	OX & FU TK ISOL VLV 3/4/5 SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
561	OX & FU TK ISOL VLV 3/4/5 SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL CLOSED
571	DIODE	FAILS SHORT
575	DIODE	FAILS SHORT
585	DIODE	FAILS SHORT
587	DIODE	FAILS SHORT
589	DIODE	FAILS SHORT
593	DIODE	FAILS SHORT
597	DIODE	FAILS SHORT
607	DIODE	FAILS SHORT
609	DIODE	FAILS SHORT
611	DIODE	FAILS SHORT
615	DIODE	FAILS SHORT
619	DIODE	FAILS SHORT
629	DIODE	FAILS SHORT
631	DIODE	FAILS SHORT
633	DIODE	FAILS SHORT
637	DIODE	FAILS SHORT
641	DIODE	FAILS SHORT
651	DIODE	FAILS SHORT
653	DIODE	FAILS SHORT
655	DIODE	FAILS SHORT
661	DIODE	FAILS SHORT
663	DIODE	FAILS SHORT

MDAC ID	ITEM	FAILURE MODE
669	DRIVER, HYBRID	FAILS HIGH
673	DRIVER, HYBRID	FAILS HIGH
677	DRIVER, HYBRID	FAILS HIGH
681	DRIVER, HYBRID	FAILS HIGH
693	DRIVER, HYBRID	FAILS HIGH
702	RELAY	FAILS OPEN
705	RELAY	FAILS HIGH
706	RELAY	FAILS OPEN
709	RELAY	FAILS HIGH
710	RELAY	FAILS OPEN
713	RELAY	FAILS HIGH
714	RELAY	FAILS OPEN
717	RELAY	FAILS HIGH
793	MANIFOLD 1, OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
798	MANIFOLD 1, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
802	MANIFOLD 2, OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
807	MANIFOLD 2, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
811	MANIFOLD 3, OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
816	MANIFOLD 3, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
820	MANIFOLD 4, OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
825	MANIFOLD 4, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
834	MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
835	MANIFOLD 5, OX & FU ISOL VLV SWITCH OPEN CONTACTS 7, 8	SWITCH OPEN CONTACTS FAIL OPEN
838	MANIFOLD 5, OX & FU ISOL VLV SWITCH GPC CONTACTS 9, 10	SWITCH GPC CONTACTS FAIL CLOSED
840	MANIFOLD 5, OX & FU ISOL VLV SWITCH CLOSE CONTACTS 11, 12	SWTICH CLOSE CONTACTS FAIL CLOSED
885	CONTROLLER, REMOTE POWER	FAILS OPEN
886	CONTROLLER, REMOTE POWER	FAILS HIGH
887	CONTROLLER, REMOTE POWER	FAILS OPEN
889	CONTROLLER, REMOTE POWER	FAILS OPEN
890	CONTROLLER, REMOTE POWER	FAILS HIGH
891	CONTROLLER, REMOTE POWER	FAILS OPEN
894	CONTROLLER, REMOTE POWER	FAILS HIGH
898	CONTROLLER, REMOTE POWER	FAILS HIGH
901	CONTROLLER, REMOTE POWER	FAILS HIGH
902	CONTROLLER, REMOTE POWER	FAILS OPEN
904	CONTROLLER, REMOTE POWER	FAILS OPEN
905	CONTROLLER, REMOTE POWER	FAILS OPEN
907	CONTROLLER, REMOTE POWER	FAILS OPEN
909	DIODE	FAILS OPEN

MDAC ID	ITEM	FAILURE MODE
911	DIODE	FAILS OPEN
913	DIODE	FAILS OPEN
915	DIODE	FAILS OPEN
917	DIODE	FAILS OPEN
919	DIODE	FAILS OPEN
921	DIODE	FAILS OPEN
922	DIODE	FAILS SHORT
923	DIODE	FAILS OPEN
925	DIODE	FAILS OPEN
927	DIODE	FAILS OPEN
928	DIODE	FAILS SHORT
929	DIODE	FAILS OPEN
931	DIODE	FAILS OPEN
933	DIODE	FAILS OPEN
934	DIODE	FAILS SHORT
935	DIODE	FAILS OPEN
936	DIODE	FAILS SHORT
937	DIODE	FAILS OPEN
939	DIODE	FAILS OPEN
941	DIODE	FAILS OPEN
943	DIODE	FAILS OPEN
945	DIODE	FAILS OPEN
947	DRIVER, HYBRID	FAILS OPEN
948	DRIVER, HYBRID	FAILS HIGH
949	DRIVER, HYBRID	FAILS OPEN
950	DRIVER, HYBRID	FAILS HIGH
954	DRIVER, HYBRID	FAILS HIGH
955	DRIVER, HYBRID	FAILS HIGH
956	DRIVER, HYBRID	FAILS OPEN
957	DRIVER, HYBRID	FAILS OPEN
960	FUSE, 1A	FAILS OPEN
963	FUSE, 1A	FAILS OPEN
966	FUSE, 1A	FAILS OPEN
968	FUSE, 1A	FAILS OPEN
970	FUSE, 1A	FAILS OPEN
971	FUSE, 1A	FAILS OPEN
972	RELAY	FAILS OPEN
974	RELAY	FAILS OPEN
976	RELAY, LATCHING	FAILS OPEN
988	RESISTOR, 1.2K 2W	FAILS OPEN
1000	RESISTOR, 1.2K 2W	FAILS OPEN
1016	RESISTOR, 1.2K 2W	FAILS OPEN
1028	RESISTOR, 1.2K 2W	FAILS OPEN
1034	RESISTOR, 1.2K 2W	FAILS OPEN
1036	RESISTOR, 1.2K 2W	FAILS OPEN
1059	RJDF1B F1 MANIFOLD DRIVER SWITCH	SWITCH FAILS IN THE OFF POSITION
1061	RJDF1B F1 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2	SWITCH ON CONTACTS FAILS OPEN
1065	RJDF1B F1 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6	SWITCH ON CONTACTS FAIL OPEN

MDAC ID	ITEM	FAILURE MODE
1067	RJDF1B F1 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8	SWITCH OFF CONTACTS FAIL CLOSED (SHORTED)
1069	RJDF1B F1 MANIFOLD LOGIC SWITCH	SWITCH FAILS IN THE OFF POSITION
1071	RJDF1B F1 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1075	RJDF1A F2 MANIFOLD DRIVER SWITCH	SWITCH FAILS IN THE OFF POSITION
1077	RJDF1A F2 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1081	RJDF1A F2 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6	SWITCH ON CONTACTS FAIL OPEN
1083	RJDF1A F2 MANIFOLD DRIVER OFF SWITCH CONTACTS 7, 8	SWITCH OFF CONTACTS FAIL CLOSED (SHORTED)
1085	RJDF1A F2 MANIFOLD LOGIC SWITCH	SWITCH FAILS IN THE OFF POSITION
1087	RJDF1A F2 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1091	RJDF2A F3 MANIFOLD DRIVER SWITCH	SWITCH FAILS IN THE OFF POSITION
1093	RJDF2A F3 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1101	RJDF2A F3 MANIFOLD LOGIC SWITCH	SWITCH FAILS IN THE OFF POSITION
1103	RJDF2A F3 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1107	RJDF2B F4/F5 MANIFOLD DRIVER SWITCH	SWITCH FAILS IN THE OFF POSITION
1109	RJDF2B F4/F5 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1117	RJDF2B F4/F5 MANIFOLD LOGIC SWITCH	SWITCH FAILS IN THE OFF POSITION
1119	RJDF2B F4/F5 MANIFOLD LOGIC SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1122	RJDF2B L5/F5/R5 MANIFOLD DRIVER SWITCH	SWITCH FAILS IN THE OFF POSITION
1124	RJDF2B L5/F5/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1128	RJDF2B L5/F5/R5 MANIFOLD DRIVER ON SWITCH CONTACTS 5, 6	SWITCH ON CONTACTS FAIL OPEN
1192	FUSE, 7.5A	FAILS OPEN
1193	FUSE, 7.5A	FAILS OPEN
1194	FUSE, 7.5A	FAILS OPEN
1195	FUSE, 7.5A	FAILS OPEN
1196	FUSE, 7.5A	FAILS OPEN
1215	HEATER 10W, THRUSTER, VERNIER, ALL AXES	FAILS OPEN
1216	HEATER 10W, THRUSTER, VERNIER, ALL AXES	FAILS SHORT
1251	MANIFOLD 1, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION

MDAC ID	ITEM	FAILURE MODE
1252	MANIFOLD 1, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1257	SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 1	FAILS TO SWITCH (FAILS IN OFF POSITION)
1259	MANIFOLD 2, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION
1260	MANIFOLD 2, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1261	MANIFOLD 2, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL CLOSED
1265	SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 2	FAILS TO SWITCH (FAILS IN OFF POSITION)
1267	MANIFOLD 3, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION
1268	MANIFOLD 3, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1273	SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 3	FAILS TO SWITCH (FAILS IN OFF POSITION)
1275	MANIFOLD 4, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION
1276	MANIFOLD 4, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1281	SWITCH, TOGGLE RCS/OMS HEATERS FWD RCS JET 4	FAILS TO SWITCH (FAILS IN OFF POSITION)
1283	MANIFOLD 5, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION
1284	MANIFOLD 5, JETS HEATER CONTROL SWITCH ON CONTACTS 1, 2	SWITCH ON CONTACTS FAIL OPEN
1295	THERMOSTAT, PRIMARY THRUSTERS, - X AXIS	FAILS TO OPEN (FAILS CLOSED)
1297	THERMOSTAT, PRIMARY THRUSTERS, Y AXIS	FAILS TO OPEN FAILS CLOSED)
1299	THERMOSTAT, PRIMARY THRUSTERS, Z AXIS	FAILS TO OPEN (FAILS CLOSED)
1300	THERMOSTAT, VERNIER THRUSTERS, ALL AXES	FAILS TO CLOSE (FAILS OPEN)
1301	THERMOSTAT, VERNIER THRUSTERS, ALL AXES	FAILS TO OPEN (FAILS CLOSED)
1302	CONTROLLER, REMOTE POWER	FAILS OPEN
1303	CONTROLLER, REMOTE POWER	FAILS HIGH
1305	CONTROLLER, REMOTE POWER	FAILS HIGH
1310	CONTROLLER, REMOTE POWER	FAILS OPEN
1311	CONTROLLER, REMOTE POWER	FAILS HIGH
1313	CONTROLLER, REMOTE POWER	FAILS HIGH
1318	DIODE	FAILS OPEN
1320	DIODE	FAILS OPEN
1322	DIODE	FAILS OPEN
1324	DIODE	FAILS OPEN
1328	DIODE	FAILS OPEN
1330	DIODE	FAILS OPEN
1332	DIODE	FAILS OPEN

MDAC ID	ITEM	FAILURE MODE
1334	DIODE	FAILS OPEN
1338	DRIVER, HYBRID	FAILS OPEN
1339	DRIVER, HYBRID	FAILS HIGH
1341	DRIVER, HYBRID	FAILS HIGH
1350	DRIVER, HYBRID	FAILS OPEN
1351	DRIVER, HYBRID	FAILS HIGH
1353	DRIVER, HYBRID	FAILS HIGH
1405	L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL OPEN
1407	L/R HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 7, 8	SWITCH OPEN CONTACTS FAIL OPEN
1410	L/R HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS 9, 10	SWITCH GPC CONTACTS FAIL CLOSED
1411	L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL OPEN
1412	L/R HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL CLOSED
1427	CONTROLLER, REMOTE POWER	FAILS HIGH
1430	CONTROLLER, REMOTE POWER	FAILS OPEN
1432	DIODE	FAILS OPEN
1433	DIODE	FAILS SHORT
1436	DIODE	FAILS OPEN
1437	DIODE	FAILS SHORT
1440	DIODE	FAILS OPEN
1441	DIODE	FAILS SHORT
1442	DIODE	FAILS OPEN
1443	DIODE	FAILS SHORT
1444	DIODE	FAILS OPEN
1445	DIODE	FAILS SHORT
1446	DIODE	FAILS OPEN
1450	DIODE	FAILS OPEN
1454	DIODE	FAILS OPEN
1458	DIODE	FAILS OPEN
1466	DIODE	FAILS OPEN
1479	DRIVER, HYBRID	FAILS HIGH
1481	DRIVER, HYBRID	FAILS HIGH
1485	DRIVER, HYBRID	FAILS HIGH
1487	DRIVER, HYBRID	FAILS HIGH
1499	DRIVER, HYBRID	FAILS HIGH
1503	DRIVER, HYBRID	FAILS HIGH
1507	DRIVER, HYBRID	FAILS HIGH
1511	DRIVER, HYBRID	FAILS HIGH
1513	DRIVER, HYBRID	FAILS HIGH
1515	DRIVER, HYBRID	FAILS HIGH
1541	RELAY	FAILS OPEN (DE-ENERGIZED)
1542	RELAY	FAILS HIGH (ENERGIZED)
1543	RELAY	FAILS OPEN (DE-ENERGIZED)
1544	RELAY	FAILS HIGH (ENERGIZED)
1545	RELAY	FAILS OPEN (DE-ENERGIZED)
1547	RELAY	FAILS OPEN (DE-ENERGIZED)
1548	RELAY	FAILS HIGH (ENERGIZED)

MDAC ID	ITEM	FAILURE MODE
1549	RELAY	FAILS OPEN (DE-ENERGIZED)
1550	RELAY	FAILS CLOSED (FAILS IN ENERGIZED POSITION)
1551	RELAY	FAILS OPEN
1553	RELAY	FAILS OPEN
1554	RELAY	FAILS HIGH
1555	RELAY	FAILS OPEN
1557	RELAY	FAILS OPEN
1558	RELAY	FAILS HIGH
1559	RELAY	FAILS OPEN
1560	RELAY	FAILS HIGH
1561	RELAY	FAILS OPEN
1563	RELAY	FAILS OPEN
1565	RELAY	FAILS OPEN
1566	RELAY	FAILS HIGH
1567	RELAY	FAILS OPEN
1568	RELAY	FAILS HIGH
1569	RELAY	FAILS OPEN
1571	RELAY	FAILS OPEN
1573	RELAY	FAILS OPEN
1576	RELAY	FAILS HIGH
1577	RELAY	FAILS OPEN
1580	RELAY	FAILS HIGH
1581	RELAY	FAILS OPEN
1584	RELAY	FAILS HIGH
1585	RELAY	FAILS OPEN
1588	RELAY	FAILS HIGH
1750	L/R OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
1755	L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
1761	L/R OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL CLOSED
1765	L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH OPEN CONTACTS 1,2	SWITCH OPEN CONTACTS FAIL OPEN
1770	L/R OX & FU TK ISOL VLV 3/4/5 A OR B SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
1781	L/R OX & FU CROSSFEED VLV 1/2 SWITCH OPEN CONTACTS 7, 8	SWITCH OPEN CONTACTS FAIL CLOSED
1785	L/R OX & FU CROSSFEED VLV 1/2 SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL CLOSED
1786	MASTER RCS CROSSFEED SWITCH	SWITCH FAILS IN FEED FROM RIGHT OR FEED FROM LEFT POSITION
1789	MASTER RCS CROSSFEED SWITCH FEED FROM RIGHT OR FEED FROM LEFT SWITCH CONTACTS	SWITCH FEED FROM RIGHT OR FEED FROM LEFT CONTACTS FAIL CLOSED
1794	L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 1,2	SWITCH OPEN CONTACTS FAIL CLOSED
1797	L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL OPEN

MDAC ID	ITEM	FAILURE MODE
1798	L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
1800	L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH OPEN CONTACTS 7, 8	SWITCH OPEN CONTACTS FAIL CLOSED
1803	L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL OPEN
1804	L/R OX & FU CROSSFEED VLV 3/4/5 SWITCH CLOSE CONTACTS 11, 12	SWITCH CLOSE CONTACTS FAIL CLOSED
1808	MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
1813	MANIFOLD 1, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
1817	MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
1822	MANIFOLD 2, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
1826	MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
1831	MANIFOLD 3, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
1835	MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH OPEN COMMAND 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
1840	MANIFOLD 4, L/R OX & FU ISOL VLV SWITCH CLOSE COMMAND 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
1849	MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 5, 6	SWITCH CLOSE CONTACTS FAIL CLOSED
1850	MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH OPEN CONTACTS 7, 8	SWITCH OPEN CONTACTS FAIL OPEN
1853	MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH GPC CONTACTS 9, 10	SWITCH GPC CONTACTS FAIL CLOSED
1855	MANIFOLD 5, L/R OX & FU ISOL VLV SWITCH CLOSE CONTACTS 11,12	SWITCH CLOSE CONTACTS FAIL CLOSED
1905	CONTROLLER, REMOTE POWER	FAILS OPEN
1907	CONTROLLER, REMOTE POWER	FAILS OPEN
1908	DIODE	FAILS SHORT
1909	DIODE	FAILS OPEN
1910	DIODE	FAILS SHORT
1911	DIODE	FAILS OPEN
1912	DIODE	FAILS SHORT
1913	DIODE	FAILS OPEN
1915	DIODE	FAILS OPEN
1917	DIODE	FAILS OPEN
1919	DIODE	FAILS OPEN
1920	DIODE	FAILS SHORT
1921	DIODE	FAILS OPEN
1923	DIODE	FAILS OPEN
1925	DIODE	FAILS OPEN
1927	DIODE	FAILS OPEN
1929	DIODE	FAILS OPEN
1930	DIODE	FAILS SHORT
1931	DIODE	FAILS OPEN

MDAC ID	ITEM	FAILURE MODE
1932	DIODE	FAILS SHORT
1933	DIODE	FAILS OPEN
1935	DIODE	FAILS OPEN
1937	DIODE	FAILS OPEN
1938	DIODE	FAILS SHORT
1939	DIODE	FAILS OPEN
1940	DIODE	FAILS SHORT
1941	DIODE	FAILS OPEN
1942	DIODE	FAILS SHORT
1943	DIODE	FAILS OPEN
1944	DIODE	FAILS SHORT
1945	DIODE	FAILS OPEN
1947	DIODE	FAILS OPEN
1949	DIODE	FAILS OPEN
1951	DIODE	FAILS OPEN
1952	DIODE	FAILS SHORT
1953	DIODE	FAILS OPEN
1955	DIODE	FAILS OPEN
1957	DIODE	FAILS OPEN
1958	DIODE	FAILS SHORT
1959	DIODE	FAILS OPEN
1961	DIODE	FAILS OPEN
1963	DIODE	FAILS OPEN
1964	DIODE	FAILS SHORT
1965	DIODE	FAILS OPEN
1966	DIODE	FAILS SHORT
1967	DIODE	FAILS OPEN
1969	DIODE	FAILS OPEN
1971	DIODE	FAILS OPEN
1972	DIODE	FAILS SHORT
1973	DIODE	FAILS OPEN
1974	DIODE	FAILS SHORT
1975	DIODE	FAILS OPEN
1977	DIODE	FAILS OPEN
1979	DIODE	FAILS OPEN
1997	DRIVER, HYBRID	FAILS OPEN
1999	DRIVER, HYBRID	FAILS OPEN
2001	DRIVER, HYBRID	FAILS OPEN
2003	DRIVER, HYBRID	FAILS OPEN
2006	FUSE, 2A	FAILS OPEN
2007	FUSE, 2A	FAILS OPEN
2008	FUSE, 1A	FAILS OPEN
2011	FUSE, 1A	FAILS OPEN
2014	FUSE, 2A	FAILS OPEN
2018	FUSE, 1A	FAILS OPEN
2020	FUSE, 1A	FAILS OPEN
2044	RESISTOR, 1.2K 2W	FAILS OPEN
2046	RESISTOR, 1.2K 2W	FAILS OPEN
2056	RESISTOR, 1.2K 2W	FAILS OPEN
2062	RESISTOR, 1.2K 2W	FAILS OPEN
2074	RESISTOR, 1.2K 2W	FAILS OPEN

MDAC ID	ITEM	FAILURE MODE
2096	RESISTOR, 1.2K 2W	FAILS OPEN
2106	RESISTOR, 1.2K 2W	FAILS OPEN
2116	RESISTOR, 1.2K 2W	FAILS OPEN
2128	RESISTOR, 1.2K 2W	FAILS OPEN
2152	RJDA1B L1/L5/R1 MANIFOLD DRIVER SWITCH	SWITCH FAILS IN THE OFF POSITION
2170	RJDA1B L1/L5/R1 MANIFOLD LOGIC SWITCH	SWITCH FAILS IN THE OFF POSITION
2180	RJDA1A L2/R2 MANIFOLD DRIVER SWITCH	SWITCH FAILS IN THE OFF POSITION
2198	RJDA1A L2/R2 MANIFOLD LOGIC SWITCH	SWITCH FAILS IN THE OFF POSITION
2208	RJDA2B L3/R3/R5 MANIFOLD DRIVER SWITCH	SWITCH FAILS IN THE OFF POSITION
2226	RJDA2B L3/R3/R5 MANIFOLD LOGIC SWITCH	SWITCH FAILS IN THE OFF POSITION
2236	RJDA2A L4/R4 MANIFOLD DRIVER SWITCH	SWITCH FAILS IN THE OFF POSITION
2254	RJDA2A L4/R4 MANIFOLD LOGIC SWITCH	SWITCH FAILS IN THE OFF POSITION
2300	DRIVER, HYBRID	FAILS OPEN
2301	DRIVER, HYBRID	FAILS HIGH
2302	DRIVER, HYBRID	FAILS OPEN
2303	DRIVER, HYBRID	FAILS HIGH
2304	DRIVER, HYBRID	FAILS OPEN
2305	DRIVER, HYBRID	FAILS HIGH
2306	DRIVER, HYBRID	FAILS OPEN
2307	DRIVER, HYBRID	FAILS HIGH
2308	DRIVER, HYBRID	FAILS OPEN
2309	DRIVER, HYBRID	FAILS HIGH
2310	FUSE, 1A	FAILS OPEN
2311	FUSE, 1A	FAILS OPEN
2312	FUSE, 1A	FAILS OPEN
2313	FUSE, 1A	FAILS OPEN
2314	FUSE, 1A	FAILS OPEN
2315	FUSE, 5A	FAILS OPEN
2322	HEATER 10W, THRUSTER, VERNIER, ALL AXES	FAILS OPEN
2323	HEATER 10W, THRUSTER, VERNIER, ALL AXES	FAILS SHORT
2335	THERMOSTAT, PRIMARY THRUSTERS, +X AXIS	FAILS TO OPEN (FAILS CLOSED)
2337	THERMOSTAT, PRIMARY THRUSTERS, Y AXIS	FAILS TO OPEN (FAILS CLOSED)
2339	THERMOSTAT, PRIMARY THRUSTERS, Z AXIS	FAILS TO OPEN (FAILS CLOSED)
2340	THERMOSTAT, VERNIER THRUSTERS, ALL AXES	FAILS TO CLOSE (FAILS OPEN)
2341	THERMOSTAT, VERNIER THRUSTERS, ALL AXES	FAILS TO OPEN (FAILS CLOSED)

MDAC ID	ITEM	FAILURE MODE
2343	MANIFOLD 1, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION
2344	MANIFOLD 1, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
2349	MANIFOLD 2, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION
2350	MANIFOLD 2, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
2355	MANIFOLD 3, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION
2356	MANIFOLD 3, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
2361	MANIFOLD 4, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION
2362	MANIFOLD 4, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2	SWITCH OPEN CONTACTS FAIL OPEN
2367	MANIFOLD 5, JETS HEATER CONTROL SWITCH	SWITCH FAILS IN THE OFF POSITION
2368	MANIFOLD 5, JETS HEATER CONTROL SWITCH OPEN CONTACTS 1, 2	SWITCH CONTACTS FAIL OPEN