INDEPENDENT ORBITER ASSESSMENT

ASSESSMENT OF THE MAIN PROPULSION SUBSYSTEM FMEA/CIL VOLUME 4 OF 4

26 FEBRUARY 1988

APPENDIX E
DETAILED ANALYSIS

This appendix contains the IOA analysis worksheets supplementing previous results reported in STSEOS Working Paper 1.0-WP-VA86001-22, Analysis of the MPS (16 January 1987). Prior results were obtained independently and documented before starting the FMEA/CIL assessment activity. Supplemental analysis was performed to address failure modes not previously considered by the IOA. Each sheet identifies the hardware item being analyzed and its failure mode. Worst case criticality is identified at the top of each sheet.

LEGEND FOR IOA ANALYSIS WORKSHEETS

Hardware Criticalities:

1	=	Loss of life or vehicle
2	=	Loss of mission or next failure of any redundant item (like or unlike) could cause loss of life/vehicle
3	=	All others

Functional Criticalities:

1R	=	Redundant hardware items (like or unlike) all of which, if failed, could cause loss of life or vehicle.
2R	=	Redundant hardware items (like or unlike) all of which, if failed, could cause loss of mission.

Redundancy Screen A:

1	=	Is Checked Out PreFlight
2	=	Is Capable of Check Out PreFlight
3	=	Not Capable of Check Out PreFlight
NA	=	Not Applicable

Redundancy Screens B and C:

P	=	Passed Screen
F	=	Failed Screen
NA	=	Not Applicable

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 1 ABORT: 3/3

ITEM: FUSE (DIFFERENTIAL PRESSURE TRANSDUCER CIRCUIT)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) GO2/GH2
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THIS FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941102 SHEET 36.9

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 2

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: REMOTE POWER CONTROLLERS, 3A (4)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RTLS DUMP SYSTEM
3) LH2 RTLS DUMP VALVES (PV17, PV18) NORMALLY CLOSED
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL OPEN THE LH2 RTLS INBD/OUTBD DUMP VALVES. THIS WILL CREATE A FIRE/EXPLOSION HAZARD ON THE PAD OR DURING BOOST.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 3 ABORT: 3/1R

ITEM: DIODES, 12A (2)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RTLS DUMP SYSTEM
3) LH2 RTLS DUMP VALVES (PV17, PV18) NORMALLY CLOSED
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WOULD ELIMINATE BLOCKING PROTECTION. A SUBSEQUENT SHORT TO GROUND IN THE SAME DIODE WOULD ELIMINATE THE ABILITY TO OPEN THE VALVE FOR LH2 MANIFOLD VENT AFTER MECO. OVERPRESSURIZATION AND RUPTURE COULD RESULT.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 4

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE, 12A (2)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RTLS DUMP SYSTEM
3) LH2 RTLS DUMP VALVES (PV17, PV18) NORMALLY CLOSED
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WOULD ELIMINATE A REDUNDANT POWER PATH TO THE OPEN SOLENOID. LOSS OF ALL REDUNDANCY WILL PRECLUDE LH2 MANIFOLD VENT AFTER MECO. OVERPRESSURIZATION AND RUPTURE COULD RESULT.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 5 ABORT: 3/1R

ITEM: DIODES, 12A (2)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RTLS DUMP SYSTEM
3) LH2 RTLS DUMP VALVES (PV17, PV18) NORMALLY CLOSED
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE VALVE OPENING. AN INADVERENT OPEN COMMAND B WOULD OPEN A VALVE. LOSS OF ALL REDUNDANCY WILL CREATE A FIRE/EXPLOSION HAZARD ON THE PAD OR DURING BOOST.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 6

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: DIODE, 12A (2)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RTLS DUMP SYSTEM
3) LH2 RTLS DUMP VALVES (PV17, PV18) NORMALLY CLOSED
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WOULD ELIMINATE POWER TO THE OPEN SOLENOID AND CLOSE THE VALVE. LOSS OF THE RELIEF VALVE (FAILING CLOSED) WOULD ALLOW OVERPRESSURIZATION AND RUPTURE.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 7 ABORT: 3/1R

ITEM: HYBRID DRIVER CONTROLLERS, TYPE I (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RTLS DUMP SYSTEM
3) LH2 RTLS DUMP VALVES (PV17, PV18) NORMALLY CLOSED
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL OPEN THE LH2 RTLS INBD/OUTBD DUMP VALVES. THIS WILL CREATE A FIRE/EXPLOSION HAZARD ON THE PAD OR DURING BOOST.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 8

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: HYBRID DRIVER CONTROLLERS, TYPE III (4)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RTLS DUMP SYSTEM
3) LH2 RTLS DUMP VALVES (PV17, PV18) NORMALLY CLOSED
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL OPEN THE LH2 RTLS INBD/OUTBD DUMP VALVES. THIS WILL CREATE A FIRE/EXPLOSION HAZARD ON THE PAD OR DURING BOOST.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/09/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 9 ABORT: 3/1R

ITEM: DIODES, 12A (2)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RTLS DUMP SYSTEM
3) LH2 RTLS DUMP VALVES (PV17, PV18) NORMALLY CLOSED
4)
5)
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:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE BLOCKING REDUNDANCY. A SUBSEQUENT SHORT TO GROUND WILL ELIMINATE BOTH OPEN SOLENOID POWER PATHS AND CLOSE THE VALVE. LOSS OF THE RELIEF VALVE COULD RESULT IN OVERPRESSURIZATION AND RUPTURE.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/09/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 10

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RTLS DUMP SYSTEM
3)
4)
5)
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:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE ONE POWER PATH TO OPEN THE SOLENOID. A SUBSEQUENT FAILURE COULD CLOSE THE VALVE. LOSS OF THE RELIEF VALVE COULD RESULT IN OVERPRESSURIZATION AND RUPTURE.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 11

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4) PANEL R4 (SWITCH LOCATION)
5) TOGGLE SWITCH
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/NA
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: SEE REFERENCES
PART NUMBER: ME452-0102-7256: 32V73A459

CAUSES: CONTAMINATION, PIECE-PART STRUCTURAL FAILURE, VIBRATION, MECHANICAL SHOCK

EFFECTS/RATIONALE:
SECOND FAILURE WILL PRECLUDE MPS DUMP AND INERT. HYDROGEN WILL ESCAPE THROUGH THE RELIEF VALVE DURING ENTRY AND LANDING, CREATING A FIRE/EXPLOSION HAZARD. NO EFFECT ON RTLS BECAUSE RTLS PUMP IS NOT MADE THROUGH FILL AND DRAIN VALVES.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 12

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 3/3

ITEM: HIGH POINT OPEN HDC (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: VIBRATION, THERMAL SHOCK, MECHANICAL SHOCK

EFFECTS/RATIONALE:
FAILURE CLOSES THE HIGH POINT BLEED VALVE AND PREVENTS ITS OPERATION. FAILURE OF THE RELIEF SHUTOFF VALVE COULD THEN CAUSE OVERPRESSURIZATION AND RUPTURE OF THE MPS.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 13 ABORT: 2/1R

ITEM: HYBRID DRIVER CONTROLLER
FAILURE MODE: FAIL ON

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES THE LH2 TOPPING VALVE TO OPEN. FAILURE OF THE OUTBOARD FILL AND DRAIN VALVE WILL ALLOW LH2 TO BE VENTED.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 14

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 3/3

ITEM: FILL AND DRAIN OPEN SWITCH BLOCKING DIODE
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES A LOSS OF MANUAL OPEN COMMAND TO THE LH2 INBOARD F/D VALVE. THIS WILL PREVENT OPENING FOR VACUUM INERT.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 15 ABORT: 3/1R

ITEM: FILL AND DRAIN OPEN SWITCH BLOCKING DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE WILL ELIMINATE REDUNDANCY AGAINST A PREMATURE CLOSURE OF THE LH2 INBOARD F/D VALVE. A CONTACT SHORT TO POWER IN S9 COULD THEN CLOSE THE INBOARD F/D VALVE DURING LOADING.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 16 ABORT: 3/1R

ITEM: HIGH POINT OPEN SWITCH BLOCKING DIODES (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES THE HIGH POINT BLEED VALVE TO REMAIN CLOSED DURING VACUUM INERT. LOSS OF ALL REDUNDANCY WILL PRECLUDE LH2 DUMP. LH2 WILL VENT OVERBOARD DURING DESCENT AND LANDING.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 17 ABORT: 3/1R

ITEM: HIGH POINT OPEN SWITCH BLOCKING DIODES (2)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL CAUSE THE HIGH POINT BLEED VALVE TO CLOSE AND REMAIN CLOSED UNLESS MANUAL SWITCH IS MOVED TO OPEN. LOSS OF ALL REDUNDANCY COULD LEAD TO OVERPRESSURIZATION AND RUPTURE.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 18 ABORT: 3/1R

ITEM: FILL AND DRAIN LA1 MDM BLOCKING DIODE (1)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES A LOSS OF THE GND OPEN COMMAND. LOSS OF ALL REDUNDANCY COULD CAUSE THE LH2 INBOARD F/D VALVE TO CLOSE DURING LOADING.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 19 ABORT: 3/3

ITEM: FILL AND DRAIN LA1 MDM BLOCKING DIODE (1)
FAILURE MODE: SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
NO ADVERSE EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 20

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 3/1R

ITEM: HIGH POINT LA1 MDM BLOCKING DIODE (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF OPEN COMMAND TO THE HIGH POINT BLEED VALVE WHICH RESULTS IN VALVE CLOSURE. LOSS OF ALL REDUNDANCY COULD LEAD TO OVERPRESSURIZATION AND RUPTURE.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 21 ABORT: 3/3

ITEM: HIGH POINT LA1 MDM BLOCKING DIODE (2)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 22 ABORT: 3/3

ITEM: HIGH POINT MONITOR RESISTORS, 5.1K (3)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 23 ABORT: 3/3

ITEM: MDM OA1
FAILURE MODE: FAIL OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 INBOARD FILL & DRAIN, TOPPING, & HI POINT BLEED VLVS (PV12, PV13, PV22)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 24

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: OPEN SWITCH BLOCKING DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ELIMINATES BLOCKING PROTECTION BETWEEN THE OPEN COMMAND AND CLOSE SOLENOID INHIBIT. LOSS OF ALL REDUNDANCY COULD OPEN THE VALVE DURING BOOST.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 25 ABORT: 3/3

ITEM: LA1 MDM ISOLATION DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE THE GROUND OPEN COMMAND. LOSS OF ALL REDUNDANCY COULD MAKE THE VALVE CLOSE DURING LOADING.

REFERENCES: DRAWING PPD41L OF THE MPS/EPDC REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 26 ABORT: 3/3

ITEM: LA1 MDM ISOLATION DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THIS FAILURE WILL HAVE NO ADVERSE EFFECT ON CREW OR VEHICLE.

REFERENCES: DRAWING PPD41L OF THE MPS/EPDC REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 27 ABORT: 3/3

ITEM: OPEN SWITCH BLOCKING DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	2/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL DISABLE THE OPENING OF THE LH2 OUTBOARD FILL AND DRAIN VALVE OPEN COMMAND. SECOND FAILURE COULD PRODUCE OVERPRESSURIZATION AND RUPTURE.

REFERENCES: DRAWING PPD41L1 IN THE MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 28

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

ITEM: OPEN SWITCH BLOCKING DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES A LOSS IN ISOLATION BETWEEN THE SWITCH AND CIRCUIT.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 29 ABORT: 3/3

ITEM: OPEN MDM ISOLATION DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW AND VEHICLE.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 30 ABORT: 3/3

ITEM: CLOSE SWITCH ISOLATION DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL CAUSE A LOSS IN BLOCKING BETWEEN THE CLOSE COMMAND AND THE OPEN SOLENOID POWER INHIBIT. A PREMATURE CLOSE COMMAND AND AN INADVERTENT OUTPUT FROM THE CLOSE HDC WOULD CLOSE THE VALVE DURING LOADING.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 31 ABORT: 3/3

ITEM: CLOSE MDM ISOLATION DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 32

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

ITEM: TRANSIENT SUPPRESSION DIODES (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 33 ABORT: 3/3

ITEM: TRANSIENT SUPPRESSION DIODES (2)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE CAUSES A LOSS IN REDUNDANCY. SECOND FAILURE OF DIODE IN OPEN SOLENOID HDC WOULD RESULT IN A SHORT LOSS OF POWER TO THE OPEN SOLENOID. THIRD FAILURE - PREMATURE CLOSE SOLENOID POWER WOULD CLOSE THE OUTBOARD FILL AND DRAIN VALVE.
IF THIS FAILURE OCCURS DURING FAST FILL, THERE COULD BE A RUPTURE AND FIRE HAZARD.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 34 ABORT: 3/3

ITEM: MONITORING RESISTORS, 2.2K (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW OR VEHICLE. FAILURE CAUSES THE LOSS OF A MONITOR.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 35 ABORT: 3/3

ITEM: SWITCH SCAN BLEED RESISTORS, 1.8K (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW OR VEHICLE. FAILURE CAUSES THE LOSS OF A MONITOR.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 36

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

ITEM: MDM OA2
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 37 ABORT: /NA

ITEM: MDM LA1
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 FILL AND DRAIN SYSTEM
3) LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE CLOSE SONEOID POWER. A SHORT FROM POWER TO THE CLOSE SOLENOID CONTROL CIRCUIT WOULD THEN CLOSE THE VALVE PREMATURELY.

REFERENCES: DRAWING PPD41L1 IN MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 38 ABORT: 3/3

ITEM: TOGGLE SWITCH
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP SYSTEM
3) LH2 FEEDLINE RELIEF ISOLATION VALVE (PV8)
4) LH2 FEEDLINE RELIEF VALVE CLOSING SOLENOID (LV25)
5) PANEL R4 (SWITCH LOCATION)
6) TOGGLE SWITCH
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 39

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: CLOSE HDC (2)
FAILURE MODE: PREMATURE OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP SYSTEM
3) LH2 FEEDLINE RELIEF ISOLATION VALVE (PV8)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A SECOND FAILURE WILL POSSIBLY RUPTURE THE MANIFOLD.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 40

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: RPC C OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP SYSTEM
3) LH2 FEEDLINE RELIEF ISOLATION VALVE (PV8)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ELIMINATES BLOCKING PROTECTION BETWEEN PARALLEL POWER PATHS. LOSS OF ALL REDUNDANCY COULD VENT H2 INTO ATMOSPHERE.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 41

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: RPC C OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP SYSTEM
3) LH2 FEEDLINE RELIEF ISOLATION VALVE (PV8)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE ONE OF TWO PATHS FOR CLOSE SOLENOID POWER. A SECOND FAILURE WILL OPEN THE LH2 RELIEF SHUTOFF VALVE, BUT THE LH2 FEEDLINE RELIEF VALVE PROVIDES REDUNDANCY.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 42

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 3/1R

ITEM: DIODE, RPC CROSSOVER
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP SYSTEM
3) LH2 FEEDLINE RELIEF ISOLATION VALVE (PV8)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	2/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE ELIMINATES THE REDUNDANCY OF TWO SEPARATE PATHS. A PREMATURE CLOSE B COMMAND COULD THEN CLOSE THE VALVE AND POSSIBLY RUPTURE THE MPS.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 43 ABORT: 3/1R

ITEM: DIODE, RPC CROSSOVER
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP SYSTEM
3) LH2 FEEDLINE RELIEF ISOLATION VALVE (PV8)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL CAUSE THE LOSS OF ONE CLOSE SOLENOID POWER PATH. A SECOND FAILURE WILL OPEN THE RELIEF SHUTOFF VALVE BUT THE LH2 FEEDLINE RELIEF VALVE PROVIDES REDUNDANCY.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 44 ABORT: 3/1R

ITEM: RPC A OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP SYSTEM
3) LH2 FEEDLINE RELIEF ISOLATION VALVE (PV8)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL ELIMINATE SOME BLOCKING REDUNDANCY. A LOSS OF ALL REDUNDANCY COULD VENT H2 INTO THE ATMOSPHERE DURING BOOST.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 45

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: RPC A OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP SYSTEM
3) LH2 FEEDLINE RELIEF ISOLATION VALVE (PV8)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL CAUSE THE LOSS OF ONE REDUNDANT CLOSE SOLENOID POWER PATH. LOSS OF ALL REDUNDANCY COULD LEAD TO H2 BEING VENTED INTO THE ATMOSPHERE DURING BOOST.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 46

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

ITEM: POSITION INDICATOR SWITCH
FAILURE MODE: FAIL OPEN, SHORT, INADVERTENT OPERATION

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP SYSTEM
3) LH2 FEEDLINE RELIEF ISOLATION VALVE (PV8)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL CAUSE A LOSS IN THE MONITORING OF LH2 RELIEF SHUTOFF VALVE POSITION.

REFERENCES: VS72-941102 SHEET 14

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 47 ABORT: 3/1R

ITEM: CLOSE HDC (TYPE I)
FAILURE MODE: FAILS ON

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL ERODE REDUNDANCY IN CLOSE SOLENOID CIRCUIT. SECOND FAILURE WILL APPLY POWER TO CLOSE SOLENOID BUT BISTABLE FEATURE GIVES REDUNDANCY. LOSS OF ALL REDUNDANCY COULD CLOSE THE VALVE WHILE THE SSME's ARE RUNNING RESULTING IN POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 48

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: OPEN HDC (TYPE I)
FAILURE MODE: FAIL ON

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
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:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE ERODES REDUNDANCY. SECOND FAILURE (PREMATURE OPEN C COMMAND) WILL APPLY POWER TO OPEN SOLENOID, BUT BISTABLE FEATURE WILL MAINTAIN VALVE POSITION.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 49 ABORT: 3/1R

ITEM: CLOSE HDC, TYPE III (2)
FAILURE MODE: FAIL ON

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE ERODE WILL REDUNDANCY OF PREMATURE CLOSE SOLENOID POWER. SECOND FAILURE (PREMATURE CLOSE CMD C) WILL APPLY POWER TO THE CLOSE SOLEONID, BUT BISTABLE FEATURE WILL MAINTAIN REDUNDANCY. PARALLEL PATH MASKS FAILURE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 50

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE, CLOSE RPC B OUTPUT
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE CAUSES LOSS OF REDUNDANT BLOCKING PROTECTION. SECOND FAILURE (SERIES RPC BLOCKING DIODE SHORTS) RESULTS IN PARALLEL RPC HAVING ITS OUTPUT TIED TO GROUND. CURRENT LIMIT WILL TRIP ELIMINATING POWER TO CLOSE SOLENOID. LOSS OF ALL REDUNDANCY COULD RESULT IN VALVE CLOSURE WHILE SSME's ARE RUNNING CAUSING POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 51 ABORT: 3/1R

ITEM: DIODE, CLOSE RPC B OUTPUT
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
P-TERMINAL OF DIODE WOULD SHORT TO GROUND. THIS WOULD ELIMINATE A REDUNDANT PATH FOR OPEN SOLENOID POWER. LOSS OF ALL REDUNDANCY COULD RESULT IN VALVE CLOSURE WHILE SSME's ARE RUNNING CAUSING POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 52

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE, CLOSING CROSSOVER
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF REDUNDANCY AGAINST APPLYING CLOSE SOLENOID POWER. LOSS OF ALL REDUNDANCY COULD RESULT IN VALVE CLOSURE WHILE SSME's ARE RUNNING CAUSING POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 1/1
MDAC ID: 53 ABORT: 1/1

ITEM: DIODE, CLOSING CROSSOVER
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	1/1	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL CAUSE LOSS OF POWER TO CLOSE SOLENOID. FAILURE TO CLOSE VALVE DURING ET SEPARATION CAN CAUSE LOSS OF VEHICLE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET ..

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 54 ABORT: 31/R

ITEM: DIODE, OPEN RPC B OUTPUT
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE CAUSES LOSS OF REDUNDANT BLOCKING PROTECTION. SECOND FAILURE (SERIES RPC BLOCKING DIODE SHORTS) RESULTING IN PARALLEL RPC HAVING ITS OUTPUT TIED TO GROUND. CURRENT LIMIT WILL TRIP ELIMINATING POWER TO OPEN SOLENOID.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 55 ABORT: 3/1R

ITEM: DIODE, OPEN RPC B OUTPUT
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE P-TERMINAL OF THE DIODE WOULD SHORT TO GROUND. THIS WOULD ELIMINATE A REDUNDANT POWER PATH TO OPEN SOLENOID. A SECOND FAILURE (THE SAME DIODE SHORTING) WOULD ELIMINATE OPEN SOLENOID POWER DUE TO PARALLEL OUTPUT RPC BEING SHORTED TO GROUND. BISTABLE FEATURE WOULD STILL MAINTAIN THE VALVE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 56 ABORT: 3/1R

ITEM: DIODE, OPEN CROSSOVER
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF REDUNDANCY IN OPEN SOLENOID CIRCUITRY. A SECOND FAILURE (OPEN SOLENOID HDC1 FAILING ON) WILL APPLY POWER TO OPEN SOLENOID. BISTABLE FEATURE MAINTAINS REDUNDANCY.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 57 ABORT: 2/1R

ITEM: DIODE, OPEN CROSSOVER
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE CAUSES LOSS OF ALL OPEN COMMANDS. A PREMATURE ACTUATION OF THE CLOSE SOLENOID COULD CLOSE THE VALVE WHILE SSME's ARE RUNNING OR LOADING CAUSING LOSS OF VEHICLE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 58

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

ITEM: OPEN POSITION SWITCH MONITOR RESISTOR (1)
FAILURE MODE: OPENS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF A POSITION MONITOR.

REFERENCES: 05-6J-200900-1

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 59 ABORT: 3/1R

ITEM: OPEN HDC, TYPE III (2)
FAILURE MODE: INTERNAL SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE WILL ELIMINATE REDUNDANCY IN THE OPEN SOLENOID CIRCUITRY. SECOND FAILURE WILL APPLY OPEN SOLENOID POWER. (i.e. INABILITY TO CLOSE THE VALVE ELECTRICALLY) MECHANICAL REDUNDANCY CAN THEM STILL CLOSE VALVE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 60

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE, CLOSE RPC C OUTPUT
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF REDUNDANT BLOCKING PROTECTION. SECOND FAILURE (SERIES RPC SHORTING TO GROUND) WILL RESULT IN ABILITY TO CLOSE THE SOLENOID. MECHANICAL REDUNDANCY WILL STILL CLOSE THE VALVE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 61 ABORT: 3/1R

ITEM: DIODE, CLOSE RPC C OUTPUT
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF A REDUNDANT POWER PATH TO THE CLOSE SOLENOID. A SECOND FAILURE COULD ELIMINATE CLOSE SOLENOID POWER. MECHANICAL REDUNDANCY WILL STILL CLOSE THE VALVE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 62

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE, OPEN RPC C OUTPUT
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
SECOND FAILURE COULD ELIMINATE OPEN SOLENOID POWER OR REDUNDANCY TO PREVENT PREMATURE CLOSURE. THIRD FAILURE COULD CLOSE THE VALVE WHILE SSME's ARE RUNNING.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 63 ABORT: 3/1R

ITEM: DIODE, OPEN RPC C OUTPUT
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL ELIMINATE ONE REDUNDANT OPEN SOLENOID POWER PATH. OPEN SOLENOID POWER COULD BE LOST ON A SECOND FAILURE. THIRD FAILURE COULD CLOSE THE VALVE WHILE SSME's ARE RUNNING.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 64

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 1/1

ITEM: OPEN HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RECIRCULATION SYSTEM
3) LH2 RECIRCULATION DISCONNECT VALVE (PD3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	1/1
LIFTOFF:	2/1R	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL PREVENT VALVE CLOSURE DUE TO THE BISTABLE VALVE FEATURE. THE FAILURE IS 1/1 FOR AN ABORT SINCE A FAILED ENGINE MIGHT NEED PROPELLANT ISOLATION.

REFERENCES: VS72-941102 SHEET 16

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 1/1
MDAC ID: 65 ABORT: /

ITEM: OPEN HDC
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 66

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: CLOSE HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RECIRCULATION SYSTEM
3) LH2 RECIRCULATION DISCONNECT VALVE (PD3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL PREVENT VALVE OPENING. A SECOND FAILURE COULD CLOSE THE VALVE PREMATURELY. A LOSS OF ALL REDUNDANCY COULD OVERPRESSURIZE THE SYSTEM AND CAUSE A RUPTURE.

REFERENCES: VS72-941102 SHEET 16

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 67 ABORT: /

ITEM: CLOSE HDC
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 68

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

ITEM: MDM OA3
FAILURE MODE: FAILS OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 RECIRCULATION SYSTEM
3) LH2 RECIRCULATION DISCONNECT VALVE (PD3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE DOES NOT CREATE A HAZARDOUS CONDITION FOR CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 16

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 69 ABORT: 3/3

ITEM: HDC - GND C/O COMMAND POWER (5)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 70

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: HDC - GND C/O COMMAND POWER (5)
FAILURE MODE: PREMATURE OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE VALVE ACTUATION. A SECOND FAILURE COULD CLOSE OR OPEN ALL FLOW CONTROL VALVES.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 71 ABORT: 3/3

ITEM: MONITOR RESISTORS (3)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL EFFECT A MONITOR. THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 72 ABORT: /

ITEM: TRANSIENT SUPPRESSION DIODES (3)
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 73 ABORT: 3/3

ITEM: ZENER DIODES (3)
FAILURE MODE: OPENS AND SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 74

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 1/1

ITEM: HDC, RELAY CONTROL POWER (3)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	1/1
LIFTOFF:	2/1R	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL OPEN ONE FLOW CONTROL VALVE PREMATURELY. A SECOND FAILURE COULD OVERPRESSURIZE THE ET. FIRST FAILURE DURING ABORTS CAN CREATE SUCH A HAZARD.

REFERENCES: VS72-941102 SHEET 21

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 75 ABORT: /

ITEM: HDC, RELAY CONTROL POWER (3)
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 76

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 1/1

ITEM: RELAY (3)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	1/1
LIFTOFF:	2/1R	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL OPEN ONE FLOW CONTROL VALVE PREMATURELY. A SECOND FAILURE COULD OVERPRESSURE THE ET. FIRST FAILURE DURING ABORTS CAN CREATE SUCH A HAZARD.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 77 ABORT: 2/1R

ITEM: RELAY (3)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THIS FAILURE WOULD CLOSE ONE SOLENOID. A SECOND FAILURE COULD CLOSE A SECOND VALVE. LOW ULLAGE PRESSURE COULD CAUSE IMPLOSION DUE TO FLIGHT LOADS.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 78

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 2/1R

ITEM: BLOCKING DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	2/1R
LIFTOFF:	3/1R	TAL:	2/1R
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE CAUSES A LOSS OF REDUNDANCY. A SECOND FAILURE WOULD ALLOW THE SPARE TRANSDUCER TO DRIVE TWO VALVES. A THIRD FAILURE COULD OVERPRESSURIZE THE ET.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 79 ABORT: 2/1R

ITEM: BLOCKING DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	2/1R
LIFTOFF:	3/1R	TAL:	2/1R
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL ERODE REDUNDANCY AND ALLOW THE SPARE TRANSDUCER TO CONTROL TWO VALVES. SECOND FAILURE WOULD ACTIVATE THE STANDBY TRANSDUCER. A FAILURE OF THE STANDBY TRANSDUCER COULD THEN OVERPRESSURIZE TH ET.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 80 ABORT: 3/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: FAILS TO XFER TO OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES A LOSS OF REDUNDANCY AGAINST PREMATURE CLOSURES. LOSS OF ALL REDUNDANCY WILL ALLOW FLOW CONTROL VALVES TO CLOSE AND CAUSE LOW PRESSURE IN LH2 TANK.

REFERENCES: VS72-941102 SHEET 23

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 81 ABORT: 1/1

ITEM: TOGGLE SWITCH
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	2/1R	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
ONE CONTACT SHORT WILL OPEN ONE VALVE. SECOND CONTACT SHORT COULD OVERPRESSURIZE THE ET. FIRST FAILURE DURING ABORTS CAN CREATE SUCH A HAZARD.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 82

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL ELIMINATE MANUAL REDUNDANCY TO OPEN A FLOW CONTROL VALVE. LOSS OF ALL REDUNDANCY COULD LEAD TO LOW LH2 PRESSURES AND CREATE A HAZARD TO CREW AND VEHICLE.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 83 ABORT: 3/1R

ITEM: SWITCH BLOCKING DIODES (6)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL ELIMINATE MANUAL REDUNDANCY TO OPEN A FLOW CONTROL VALVE. LOSS OF ALL REDUNDANCY COULD LEAD TO LOW LH2 PRESSURES AND CREATE A HAZARD TO CREW AND VEHICLE.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 84

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

ITEM: SWITCH BLOCKING DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 85 ABORT: 3/3

ITEM: SWITCH SCAN MONITOR RESISTOR
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL NOT HAVE A HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 86

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

ITEM: SWITCH SCAN BLEED RESISTOR
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 87 ABORT: 3/3

ITEM: SW SCAN DIODES (3)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 88

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 2/1R

ITEM: SWITCH SCAN DIODES (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/1R	TAL:	2/1R
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL ERODE REDUNDANCY. A SECOND SWITCH SCAN DIODE SHORTING WOULD CONNECT ONE SWITCH CONTACT TO TWO FLOW CONTROL VALVES. A SHORT TO POWER COULD THEN OVERPRESSURIZE THE ET.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 89 ABORT: 3/1R

ITEM: MDM INHIBIT COMMAND DIODES (6)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
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:	3/1R		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE CAUSES A LOSS IN THE MDM CAPABILITY TO INHIBIT CLOSE SOLENOID POWER. A LOSS OF ALL REDUNDANCY COULD LEAD TO THE CLOSURE OF FLOW CONTROL VALVES AND LOW ULLAGE PRESSURE IN THE LH2 TANK.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 90

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

ITEM: MDM INHIBIT COMMAND DIODES (6)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, LV57, LV58)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL NOT HAVE A HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/09/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 91 ABORT: 3/1R

ITEM: LOCK RPC (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/09/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 92 ABORT: 3/1R

ITEM: LOCK RPC (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE LOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 93

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK RPC (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 94

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK RPC (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 95 ABORT: 3/1R

ITEM: LOCK HDC I
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

C-2

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 96

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK HDC I
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE LOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 97 ABORT: 3/1R

ITEM: UNLOCK HDC I
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 98 ABORT: 3/1R

ITEM: UNLOCK HDC I
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 99 ABORT: 3/1R

ITEM: LOCK HDC III (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 100 ABORT: 3/1R

ITEM: LOCK HDC III (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE LOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 101

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK HDC III (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 102 ABORT: 3/1R

ITEM: UNLOCK HDC III (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 103 ABORT: 3/1R

ITEM: LOCK RPC C OUTPUT DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 104 ABORT: 3/1R

ITEM: LOCK RPC C OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE BLOCKING REDUNDANCY IN THE LOCK SOLENOID CIRCUIT. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 105

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK RPC C OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN CONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 106

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK RPC B OUTPUT DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 107 ABORT: 3/1R

ITEM: UNLOCK RPC B OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE BLOCKING REDUNDANCY IN THE UNLOCK SOLENOID CIRCUIT. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 108

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK RPC B OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 109 ABORT: 3/1R

ITEM: LOCK RPC CROSSOVER DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER IN THE LOCK SOLENOID CIRCUIT. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 110 ABORT: 3/1R

ITEM: LOCK RPC CROSSOVER DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ERODES BLOCKING REDUNDANCY IN THE OPEN SOLENOID CIRCUIT. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 111 ABORT: 3/1R

ITEM: LOCK RPC CROSSOVER DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE POWER TO THE OPEN SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTINAED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 112 ABORT: 3/1R

ITEM: UNLOCK RPC CROSSOVER DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 113

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK RPC CROSSOVER DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE BLOCKING REDUNDANCY IN THE UNLOCK SOLENOID CIRCUIT. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 114

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: UNLOCK RPC CROSSOVER DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 115 ABORT: 3/1R

ITEM: TRANSIENT SUPPRESSION DIODES (2)
FAILURE MODE: ALL

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE OF THE DIODE PLUS THE FAILURE OF AN INTERNAL HDC DIODE WILL GROUND A SOLENOID. A LOSS OF ALL REDUNDANCY COULD RESULT IN LOSS OF CREW AND VEHICLE.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 116

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

ITEM: UNLOCK POSITION SWITCH MONITOR RESISTORS (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURES HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 117 ABORT: 3/3

ITEM: LOCK POSITION SWITCH MONITOR RESISTORS (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 118

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

ITEM: RPC AND SOLENOID POWER MONITOR RESISTORS (6)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 119 ABORT: 3/1R

ITEM: LOCK RPC B OUTPUT DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 120

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK RPC B OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ERODES BLOCKING PROTECTION IN THE LOCK SOLENOID CIRCUIT. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 121

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK RPC B OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 122

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK RPC C OUTPUT DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 123 ABORT: 3/1R

ITEM: UNLOCK RPC C OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE BLOCKING REDUNDANCY IN THE UNLOCK SOLENOID CIRCUIT. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 124

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK RPC C OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 125 ABORT: 3/3

ITEM: BLEED RESISTORS (4)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT LATCH (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41S1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 128

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LH2 PREVALVE TOGGLE SWITCHES (3)
FAILURE MODE: OPEN CONTACTS SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE OPEN SOLENOID POWER. A LOSS OF ALL REDUNDANCY COULD CAUSE UNCONTAINED ENGINE DAMAGE, RUPTURE, OR A FIRE HAZARD.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 129 ABORT: 3/1R

ITEM: LH2 PREVALVE TOGGLE SWITCHES (3)
FAILURE MODE: CLOSE CONTACTS SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE OPEN SOLENOID POWER. A LOSS OF ALL REDUNDANCY COULD CAUSE UNCONTAINED ENGINE DAMAGE, RUPTURE, OR A FIRE HAZARD.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 130 ABORT: 3/1R

ITEM: LH2 PREVALVES OPEN COMMAND B RPC OUTPUT DIODES, 12A (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE REDUNDANT PATHS FOR OPEN SOLENOID POWER. A LOSS OF ALL REDUNDANCY COULD CLOSE THE PREVALVE PREMATURELY.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 131

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LH2 PREVALVES OPEN COMMAND B RPC OUTPUT DIODES, 12A (3)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE REDUNDANT PATHS FOR OPEN SOLENOID POWER. A LOSS OF ALL REDUNDANCY COULD CLOSE THE PREVALVE PREMATURELY.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 132

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LH2 PREVALVE OPEN RPC CROSSOVER DIODES, 12A (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL CONNECT THE TWO PATHS FOR OPEN SOLENOID POWER. A LOSS OF ALL REDUNDANCY COULD CLOSE THE PREVALVE PREMATURELY.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 133 ABORT: 2/1R

ITEM: LH2 PREVALVE OPEN RPC CROSSOVER DIODES, 12A (3)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL ELIMINATE REDUNDANT PATHS FOR OPEN SOLENOID POWER. A SECOND FAILURE COULD CLOSE THE PREVALVE PREMATURELY.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 134

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 2/1R

ITEM: LH2 PREVALVE CLOSE COMMAND A RPC OUTPUT DIODES, 12A (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/1R	TAL:	2/1R
ONORBIT:	3/1R	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ERODES REDUNDANCY IN THE CLOSE SOLENOID POWER CIRCUIT. A LOSS OF ALL REDUNDANCY COULD RESULT IN THE INABILITY TO ISOLATE A FAILED SSME.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 135 ABORT: 2/1R

ITEM: LH2 PREVALVE CLOSE COMMAND A RPC OUTPUT DIODES, 12A (3)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/1R	TAL:	2/1R
ONORBIT:	3/1R	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ELIMINATES A POWER PATH TO THE CLOSE SOLENOID. A LOSS OF ALL REDUNDANCY COULD RESULT IN THE INABILITY TO ISOLATE A FAILED SSME.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 136

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 2/1R

ITEM: LH2 PREVALVES CLOSE RPC CROSSOVER DIODES, 12A (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/1R	TAL:	2/1R
ONORBIT:	3/1R	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY IN THE CLOSE SOLENOID POWER CIRCUIT. THE LOSS OF ALL REDUNDANCY COULD RESULT IN THE INABILITY TO ISOLATE A FAILED SSME.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 137 ABORT: 1/1

ITEM: LH2 PREVALVE CLOSE RPC CROSSOVER DIODE, 12A (3)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	2/1R	TAL:	1/1
ONORBIT:	2/1R	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE CLOSE SOLENOID POWER. A SUBSEQUENT FAILED SSME COULD NOT BE ISOLATED.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 138 ABORT: 3/3

ITEM: LH2 PREVALVES OPEN MDM BLOCKING DIODES (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 139

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

ITEM: LH2 PREVALVES CLOSE MDM BLOCKING DIODES (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS FAILURE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 140

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

ITEM: LH2 PREVALVES OPEN MDM BLOCKING DIODES (3)
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 141

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

ITEM: LH2 PREVALVE CLOSE MDM BLOCKING DIODES (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 142 ABORT: 3/3

ITEM: LH2 PREVALVES MAINSTAGE BLOCKING DIODES (6)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 143 ABORT: 3/1R

ITEM: LH2 PREVALVES BLOCKING DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD CAUSE PREVALVE TO CLOSE DURING ENGINE BURN, RESULTING IN ENGINE EXPLOSION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 144 ABORT: 3/1R

ITEM: LH2 PREVALVE CLOSE SWITCH COMMAND A BLOCKING DIODES (3)
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
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:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL PRECLUDE ENGINE ISOLATION IN THE EVENT OF AN ENGINE SHUTDOWN.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 145 ABORT: 3/1R

ITEM: LH2 PREVALVES OPEN SWITCH COMMAND C BLOCKING DIODES (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD CAUSE PREVALVE TO CLOSE DURING ENGINE BURN, RESULTING IN ENGINE EXPLOSION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 146 ABORT: 3/1R

ITEM: LH2 PREVALVES OPEN SWITCH COMMAND B BLOCKING DIODES (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD CAUSE PREVALVE TO CLOSE DURING ENGINE BURN, RESULTING IN ENGINE EXPLOSION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 147

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LH2 PREVALVES CLOSE SWITCH B&C BLOCKING DIODES (6)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
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:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL PRECLUDE ENGINE ISOLATION IN THE EVENT OF AN ENGINE SHUTDOWN.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 148 ABORT: 3/1R

ITEM: LH2 PREVALVES OPEN SWITCH BLOCKING DIODES (6)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
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:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL PRECLUDE ENGINE ISOLATION IN THE EVENT OF AN ENGINE SHUTDOWN.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 149 ABORT: 3/1R

ITEM: LH2 PREVALVES OPEN SWITCH SCAN DIODES (9)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
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:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL PRECLUDE THE ISOLATION OF AN ENGINE WITH UNCONTAINED DAMAGE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 150 ABORT: 3/1R

ITEM: LH2 PREVALVES CLOSE SWITCH SCAN DIODES (9)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD CAUSE PREVALVE TO CLOSE DURING ENGINE BURN, RESULTING IN ENGINE EXPLOSION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 151

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LH2 PREVALVES OPEN COMMAND A RPC OUTPUT DIODES (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD CAUSE PREVALVE TO CLOSE DURING ENGINE BURN, RESULTING IN ENGINE EXPLOSION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 152 ABORT: 3/1R

ITEM: LH2 PREVALVES OPEN COMMAND A RPC OUTPUT DIODES (3)
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD CAUSE PREVALVE TO CLOSE DURING ENGINE BURN, RESULTING IN ENGINE EXPLOSION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 153

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LH2 PREVALVES CLOSE COMMAND B RPC OUTPUT DIODES (3)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY WILL PRECLUDE ENGINE ISOLATION IN THE EVENT OF UNCONTAINED DAMAGE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 154 ABORT: 3/1R

ITEM: LH2 PREVALVES CLOSE COMMAND B RPC OUTPUT DIODES (3)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 PROPELLANT FEED SYSTEM
3) LH2 PREVALVES (PV4, PV5, PV6)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY WILL PRECLUDE ENGINE ISOLATION IN THE EVENT OF UNCONTAINED DAMAGE.

REFERENCES: VS72-941102 SHEET 9 AND 10

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 201 ABORT: 1/1

ITEM: LO2 TANK PRE-PRESS CHECK VALVE (CV16)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 202 ABORT: 3/3

ITEM: LO2 BLEED CHECK VALVE (CV31, 33, 35)
FAILURE MODE: CLOGGED ORIFICE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 203 ABORT: 1/1

ITEM: LO2 BLEED CHECK VALVE (CV31,33,35)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 204 ABORT: 1/1

ITEM: GO2 PRESSURE FLOW CONTROL VALVE (LV53,54,55)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 205 ABORT: 1/1

ITEM: LO2 FEED (ORB/ET) DISCONNECT (PD1)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
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7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 206 ABORT: 2/1R

ITEM: LO2 FEED (ORB/ET) DISCONNECT (PD1)
FAILURE MODE: FAIL TO RELIEVE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 207 ABORT: 3/3

ITEM: LO2 FEED (ORB/ET) DISCONNECT (PD1)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 208 ABORT: 1/1

ITEM: LO2 FEED DISCONNECT (PD1)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 209 ABORT: /

ITEM: LO2 FEED DISCONNECT (PD1)
FAILURE MODE: LCC DECEPTION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
GENERATED IN RESPONSE TO AN RI/NASA CIL. FAILURE MODE IS ADEQUATELY ADDRESSED ELSE WHERE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 210 ABORT: 1/1

ITEM: LO2 AND LH2 FEED DISCONNECT LATCH ASSEMBLY (ORB ONLY)
FAILURE MODE: FAIL TO REMAIN LOCKED

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 211 ABORT: 2/1R

ITEM: LO2 AND LH2 FEED DISCONNECT LATCH ASSEMBLY (ORB ONLY)
FAILURE MODE: FAIL TO UNLOCK POST-MECO

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 212 ABORT: 2/1R

ITEM: LO2 AND LH2 FEED DISCONNECT LATCH ASSEMBLY (ORB ONLY)
FAILURE MODE: FAIL TO REMAIN UNLOCKED DURING SEP OPS

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 213 ABORT: 2/1R

ITEM: LO2 AND LH2 FEED DISCONNECT LATCH ASSEMBLY (ORB ONLY)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 214 ABORT: 3/3

ITEM: LO2 AND LH2 FEED DISCONNECT LATCH ASSEMBLY (ORB ONLY)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 215 ABORT: 1/1

ITEM: LO2 AND LH2 FEED DISCONNECT LATCH ASSEMBLY (ORB ONLY)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 216 ABORT: 2/1R

ITEM: LO2 AND LH2 FEED DISCONNECT LATCH ASSEMBLY (ORB ONLY)
FAILURE MODE: LATCH ROD FAILS TO TOGGLE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/21/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 217 ABORT: /

ITEM: LO2 AND LH2 FEED DISCONNECT LATCH ASSEMBLY (ORB ONLY)
FAILURE MODE: LCC DECEPTION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
GENERATED IN RESPONSE TO AN RI/NASA CIL WORKSHEET. FAILURE MODE IS ADEQUATELY ADDRESSED ELSE WHERE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 218 ABORT: 1/1

ITEM: LO2 FILL AND DRAIN DISCONNECT (PD12)
FAILURE MODE: FAIL TO REMAIN OPEN

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 219 ABORT: /

ITEM: LO2 FILL AND DRAIN DISCONNECT (PD12)
FAILURE MODE: FAIL TO OPEN

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 220 ABORT: /

ITEM: LO2 FILL AND DRAIN DISCONNECT (PD12)
FAILURE MODE: FAIL TO CLOSE AT LIFTOFF

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 221 ABORT: /

ITEM: LO2 FILL AND DRAIN DISCONNECT (PD12)
FAILURE MODE: PROBE DISENGAGEMENT FAILURE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 222 ABORT: /

ITEM: LO2 PREVALVE (PV1, 2, 3)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/22/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 223 ABORT: /

ITEM: LO2 PREVALVE (PV1, 2, 3)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 224 ABORT: /

ITEM: LO2 PREVALVE (PV1, 2, 3)
FAILURE MODE: LCC DECEPTION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
GENERATED IN RESPONSE TO AN RI/NASA CIL. FAILURE IS ADEQUATELY ADDRESSED ELSEWHERE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 225 ABORT: /

ITEM: LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
FAILURE OF THE INDICATION SYSTEM ONLY WILL HAVE NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 226 ABORT: /

ITEM: LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
FAILURE MODE: INTERNAL ACTUATOR LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 227 ABORT: /

ITEM: LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 228 ABORT: /

ITEM: LO2 OUTBOARD FILL AND DRAIN VALVE (PV9)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 229 ABORT: /

ITEM: LO2 OUTBOARD FILL AND DRAIN VALVE (PV9)
FAILURE MODE: RELIEF VALVE FAILS TO REMAIN CLOSED, LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 230 ABORT: /

ITEM: LO2 OUTBOARD FILL AND DRAIN VALVE (PV9)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 231 ABORT: /

ITEM: LO2 OUTBOARD FILL AND DRAIN VALVE (PV9)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 232 ABORT: /

ITEM: LO2 INBOARD FILL AND DRAIN VALVE (PV10)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
FAILURE OF THE INDICATOR ALONE WILL HAVE NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 233 ABORT: /

ITEM: LO2 INBOARD FILL AND DRAIN VALVE (PV10)
FAILURE MODE: FAILS TO RELIEVE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 234 ABORT: /

ITEM: LO2 INBOARD FILL AND DRAIN VALVE (PV10)
FAILURE MODE: RELIEF VALVE FAILS TO RESEAT, LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 235 ABORT: /

ITEM: LO2 INBOARD FILL AND DRAIN VALVE (PV10)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 236 ABORT: /

ITEM: LO2 INBOARD FILL AND DRAIN VALVE (PV10)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 237 ABORT: /

ITEM: LO2 INBOARD FILL AND DRAIN VALVE (PV10)
FAILURE MODE: LCC DECEPTION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THIS FAILURE IS ALREADY ADDRESSED IN (0310-3) AND (0130-9).

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 238 ABORT: /

ITEM: LO2 BLEED SHUTOFF VALVE (PV19)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/25/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 239 ABORT: /

ITEM: LO2 BLEED SHUTOFF VALVE (PV19)
FAILURE MODE: RUPTURE/LEAKAGE OF VALVE ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 240 ABORT: /

ITEM: LO2 POGO ACCUMULATOR RECIRC VALVE (PV20, 21)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
FAILURE OF THE INDICATOR ALONE WILL HAVE NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 241 ABORT: /

ITEM: LO2 POGO ACCUMULATOR RECIRC VALVE (PV20, 21)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 243 ABORT: /

ITEM: LH2/LO2 PROPELLANT LEVEL SENSORS
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 244 ABORT: /

ITEM: LH2/LO2 PROPELLANT LEVEL SENSORS
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 247 ABORT: /

ITEM: LH2 DELTA-P TRANSDUCER (MT44)
FAILURE MODE: RUPTURE OF DIAPHRAGM

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 248 ABORT: /

ITEM: LO2 12 INCH FEEDLINE (FH 3, 4, 5)
FAILURE MODE: EXCESS ANNULUS PRESSURE INCREASE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 249 ABORT: /

ITEM: LO2 12 INCH FEEDLINE (FH 3, 4, 5)
FAILURE MODE: LOSS OF INSULATION PROPERTIES

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 250 ABORT: /

ITEM: GO2 PRESSURE MANIFOLD REPRESS ORIFICE (RP1)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 251 ABORT: /

ITEM: LO2 BLEED LINE, 1.5" DIA
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 252 ABORT: /

ITEM: LO2 RELIEF LINE (PV7 TO RV5)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 253 ABORT: /

ITEM: LO2 RELIEF LINE, 1" DIA (RV5 TO EXIT)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88
SUBSYSTEM: MPS
MDAC ID: 254

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: LO2 RELIEF SENSE LINE, .38" DIA
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 255 ABORT: /

ITEM: LO2 RELIEF SENSE LINE, .38" DIA
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88
SUBSYSTEM: MPS
MDAC ID: 256

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: LO2 BLEED RECIRC & POGO SUPPRESSION LINE, 1, 1.5, 2" DIA
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 257 ABORT: /

ITEM: LO2 BLEED RECIRC & POGO SUPPRESSION LINE, 1, 1.5, 2" DIA
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
FAILURE MODE IS ADDRESSED ON 0428-1. THIS FMEA/CIL SHOULD BE DELETED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 258 ABORT: /

ITEM: LO2 DELTA PRESSURE LINE, .25" DIA
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 259 ABORT: /

ITEM: LO2 FEEDLINE SCREEN
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 260 ABORT: /

ITEM: LO2 FEEDLINE SCREEN
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 261 ABORT: /

ITEM: LO2 LINE ASSEMBLY (PD1 TO CV12 & RP1 TO CV10)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 262 ABORT: /

ITEM: GO2 PRESSURIZATION SUPPLY LINE, .63" DIA, CV TO FCV
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 263 ABORT: /

ITEM: GO2 PRESSURIZATION SUPPLY LINE (LV53, 54, 55 TO PD4)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88
SUBSYSTEM: MPS
MDAC ID: 264

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: GO2 PRESSURIZATION SUPPLY LINE (CV16 TO PD9)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 265 ABORT: /

ITEM: LO2 ULLAGE PRESSURE SIGNAL CONDITIONER
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 266 ABORT: /

ITEM: LO2 ULLAGE PRESSURE SIGNAL CONDITIONER
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 267 ABORT: /

ITEM: LO2 ULLAGE PRESSURE SIGNAL CONDITIONER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 268 ABORT: /

ITEM: GO2 PRESSURIZATION SUPPLY LINE
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 269 ABORT: /

ITEM: LO2 SENSE LINE (PD1 TO PR5)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 270 ABORT: /

ITEM: LO2 ENGINE INLET PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 271 ABORT: /

ITEM: LO2 MANIFOLD PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 272 ABORT: /

ITEM: GO2 DISCONNECT PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 273 ABORT: /

ITEM: LO2 ENGINE INLET TEMPERATURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 274 ABORT: /

ITEM: GO2 ENGINE OUTLET TEMPERATURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 275 ABORT: 3/3

ITEM: LO2 FEED MANIFOLD DISCONNECT TEMPERATURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 276 ABORT: /

ITEM: LO2/LH2 NAFLEX FLANGE FACE SEALS
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 277 ABORT: /

ITEM: LO2/LH2 METALLIC BOSS SEALS (K SEALS)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 278 ABORT: /

ITEM: GO2/GH2 K SEALS
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 279 ABORT: /

ITEM: GO2/GH2 NAFLEX FLANGE FACE SEALS
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 280 ABORT: /

ITEM: LH2 INBOARD FILL AND DRAIN VALVE (PV12)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 281 ABORT: /

ITEM: LH2 INBOARD FILL AND DRAIN VALVE (PV12)
FAILURE MODE: RELIEF VALVE FAILS TO RESEAT, REVERSE LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 282 ABORT: /

ITEM: LH2 INBOARD FILL AND DRAIN VALVE
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 283 ABORT: /

ITEM: LH2 INBOARD FILL AND DRAIN VALVE (PV12)
FAILURE MODE: LCC DECEPTION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THIS FAILURE MODE WAS ADEQUATELY ADDRESSED IN (0301-3) AND (0301-8).

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 284 ABORT: /

ITEM: LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 285 ABORT: /

ITEM: LH2 OUTBOARD FILL AND DRAIN VALVE (PV11)
FAILURE MODE: RELIEF VALVE FAILS TO REMAIN CLOSED

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 286 ABORT: /

ITEM: LH2 OUTBOARD FILL & DRAIN VALVE (PV11)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 287 ABORT: /

ITEM: LH2 OUTBOARD FILL & DRAIN VALVE (PV11)
FAILURE MODE: LCC DECEPTION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THIS FAILURE MODE SHOULD BE ADEQUATELY ADDRESSED BY (0302-3) AND (0302-7).

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 288 ABORT: /

ITEM: LH2 FILL & DRAIN DISCONNECT (PD11)
FAILURE MODE: FAILS TO REMAIN OPEN

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 289 ABORT: /

ITEM: LH2 FILL & DRAIN DISCONNECT (PD11)
FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 290 ABORT: /

ITEM: LH2 FILL & DRAIN DISCONNECT (PD11)
FAILURE MODE: FAILS TO CLOSE AT T-O SEP

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 291 ABORT: /

ITEM: LH2 FILL & DRAIN DISCONNECT (PD11)
FAILURE MODE: PROBE DISENGAGEMENT AT T-O

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 292 ABORT: /

ITEM: LH2 HI POINT BLEED DISCONNECT (PD17)
FAILURE MODE: FAILS TO REMAIN OPEN

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 293 ABORT: /

ITEM: LH2 HI POINT BLEED DISCONNECT (PD17)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 294 ABORT: /

ITEM: LH2 REPLENISH VALVE (PV13)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 295 ABORT: /

ITEM: LH2 REPLENISH VALVE (PV13)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 296 ABORT: /

ITEM: LH2 REPLENISH VALVE (PV13)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 297 ABORT: /

ITEM: LH2 HI POINT BLEED VALVE (PV22)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 298 ABORT: /

ITEM: LH2 HI POINT BLEED VALVE (PV22)
FAILURE MODE: FAIL TO RELIEVE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THIS ANALYSIS IS A DUPLICATE OF (0431-5).

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 299 ABORT: /

ITEM: LH2 HI POINT BLEED VALVE
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 300 ABORT: /

ITEM: LH2 HI POINT BLEED VALVE (PV22)
FAILURE MODE: FAIL TO RELIEVE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 301 ABORT: /

ITEM: LH2 SYSTEM DELTA-P TRANSDUCER (MT44)
FAILURE MODE: RUPTURE OF DIAPHRAGM

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 303 ABORT: /

ITEM: LH2 DELTA-P LINE, .25" DIA
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY : HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 304 ABORT: /

ITEM: LH2 HI POINT BLEED LINE (PV22 TO PD17)
FAILURE MODE: LOSS OF INSULATING VACUUM

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET ..

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 305 ABORT: /

ITEM: LH2 HI POINT BLEED LINE (PV22 TO PD17)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 306 ABORT: /

ITEM: LH2 LINE ASSEMBLY (PD2 TO RV7, CV15)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 307 ABORT: /

ITEM: LH2 RECIRCULATION DISCONNECT VLAVE (PD3)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 308 ABORT: 3/3

ITEM: LH2 RECIRCULATION DISCONNECT VALVE (PD3)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 309 ABORT: /

ITEM: LH2 RECIRCULATION DISCONNECT VALVE (PD3)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 310 ABORT: /

ITEM: LH2 RECIRCULATION DISCONNECT VALVE (PD3)
FAILURE MODE: CAVITY FAILS TO RELIEVE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 311 ABORT: /

ITEM: LH2 RECIRCULATION DISCONNECT VALVE (PD3)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 312 ABORT: /

ITEM: LH2 RECIRCULATION PUMP VALVE (PV14, 15, 16)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 313 ABORT: /

ITEM: LH2 RECIRCULATION PUMP VALVE (PV14, 15, 16)
FAILURE MODE: NOT IDENTIFIED

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 314 ABORT: /

ITEM: LH2 RECIRCULATION PUMP VALVE (PV14, 15, 16)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 315 ABORT: /

ITEM: LH2 RECIRCULATION PUMP (PP1, 2, 3)
FAILURE MODE: LOSS OF PUMP SPEED INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 316 ABORT: /

ITEM: GH2 PRESSURIZATION ISOLATION CHECK VALVE (CV21, 22, 23)
FAILURE MODE: FAILS TO CHECK

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 317 ABORT: /

ITEM: GH2 PRESSURIZATION ISOLATION CHECK VALVE (CV21, 22, 23)
FAILURE MODE: FAILS TO CLOSE, LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/29/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 318 ABORT: /

ITEM: GH2 PRESSURIZATION FLOW CONTROL VALVE (LV56, 57, 58)
FAILURE MODE: CLOGGED FLOW PATH

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [3] B [P] C [F]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 319 ABORT: /

ITEM: LH2 FEED DISCONNECT VALVE (PD2)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 320 ABORT: /

ITEM: LH2 FEED DISCONNECT VALVE (PD2)
FAILURE MODE: FAIL TO RELIEVE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 321 ABORT: /

ITEM: LH2 FEED DISCONNECT VALVE (PD2)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 322 ABORT: /

ITEM: LH2 FEED DISCONNECT VALVE (PD2)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 323 ABORT: /

ITEM: LH2 FEED DISCONNECT VALVE (PD2)
FAILURE MODE: LCC DECEPTION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THIS FAILURE MODE IS ADEQUATELY ADDRESSED UNDER (0407-5) AND (0407-10).

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 324 ABORT: /

ITEM: LH2 PREVALVE (PV4, 5, 6)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 325 ABORT: /

ITEM: LH2 PREVALVE (PV4, 5, 6)
FAILURE MODE: RUPTURE/LEAKAGE OF ACTUATOR

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 326 ABORT: /

ITEM: LH2 PREVALVE (PV4, 5, 6)
FAILURE MODE: LCC DECEPTION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THIS FAILURE SHOULD BE ADEQUATELY ADDRESSED UNDER (0402-6) AND (0402-7).

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 327 ABORT: /

ITEM: LH2 FEEDLINE SCREEN
FAILURE MODE: RUPTURE/STRUCTURAL FAILURE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 328 ABORT: /

ITEM: LH2 FEEDLINE SCREEN
FAILURE MODE: CLOGGING/RESTRICTION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 329 ABORT: /

ITEM: LH2 FEEDLINE RELIEF SHUTOFF VALVE (PV8)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 330 ABORT: /

ITEM: LH2 FEEDLINE RELIEF SHUTOFF VALVE (PV8)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 331 ABORT: /

ITEM: LH2 FEEDLINE RELIEF SHUTOFF VALVE (PV8)
FAILURE MODE: ACTUATOR LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 332 ABORT: /

ITEM: LH2 FEEDLINE RELIEF FLAME ARRESTOR (FL1)
FAILURE MODE: FAIL TO ARREST

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 333 ABORT: /

ITEM: LH2 FEEDLINE RELIEF FLAME ARRESTOR (FL1)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 334 ABORT: /

ITEM: LH2 FEED RTLS INBOARD VALVE (PV17)
FAILURE MODE: INBD FAILS TO RELIEVE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 335 ABORT: 3/3

ITEM: LH2 FEED RTLS INBOARD VALVE (PV17)
FAILURE MODE: RELIEF VALVE FAILS TO RESEAT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 336 ABORT: /

ITEM: LH2 FEED RTLS INBOARD VALVE (PV17)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
FAILURE OF THE INDICATOR ALONE WILL HAVE NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 337 ABORT: /

ITEM: LH2 FEED RTLS INBOARD VALVE (PV17)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 338 ABORT: /

ITEM: LH2 FEED RTLS OUTBOARD VALVE (PV18)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 339 ABORT: /

ITEM: LH2 FEED RTLS OUTBOARD VALVE (PV18)
FAILURE MODE: LOSS OF POSITION INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 340 ABORT: /

ITEM: LH2 RELIEF LINE (FROM PV8 TO RV6)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 341 ABORT: /

ITEM: LH2 RELIEF LINE (RV6 TO FL1)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 342 ABORT: /

ITEM: LH2 RELIEF SENSE LINE
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 343 ABORT: /

ITEM: LH2 RELIEF SENSE LINE
FAILURE MODE: CLOGGED

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 344 ABORT: /

ITEM: GH2 PRESSURIZATION SUPPLY LINE (CV21 TO LV56, CV22 TO LV57, CV23 TO LV58)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 345 ABORT: /

ITEM: GH2 PRESSURIZATION SUPPLY LINE (LV56, 57, 58 TO PD5)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 346 ABORT: /

ITEM: GH2 PRESSURIZATION SUPPLY LINE (PD10 TO CV17)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 347 ABORT: /

ITEM: GH2 PRESSURIZATION SUPPLY LINE (MANIFOLD ASSEMBLY)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 348 ABORT: /

ITEM: GH2 PRESSURIZATION SUPPLY LINE (LV52 TO PD5)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 349 ABORT: /

ITEM: LH2 SENSE LINE (PD2 TO PR6)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 350 ABORT: /

ITEM: LH2 RTLS DUMP LINE (PD2 TO PV17)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88
SUBSYSTEM: MPS
MDAC ID: 351

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: LH2 RTLS DUMP LINE (PV17 TO PV18)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 352 ABORT: /

ITEM: LH2 RTLS DUMP LINE (PV18 TO OUTLET)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 353 ABORT: /

ITEM: LH2 ULLAGE PRESSURE SIGNAL CONDITIONER
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 354 ABORT: /

ITEM: LH2 ULLAGE PRESSURE SIGNAL CONDITIONER
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 355 ABORT: /

ITEM: LH2 ULLAGE PRESSURE SIGNAL CONDITIONER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 360 ABORT: /

ITEM: LH2 INLET PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 361 ABORT: /

ITEM: LH2 ENGINE MANIFOLD PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 362 ABORT: /

ITEM: GH2 OUTLET PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 363 ABORT: /

ITEM: GH2 DISCONNECT PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 364 ABORT: /

ITEM: LH2 FEED MANIFOLD DISCONNECT TEMPERATURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 365 ABORT: /

ITEM: LH2 ENGINE INLET TEMPERATURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 366 ABORT: /

ITEM: ENGINE HELIUM SUPPLY CHECK VALVE (CV1, 2, 3)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 367 ABORT: /

ITEM: HELIUM SUPPLY DISCONNECT (PD8)
FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 369 ABORT: /

ITEM: ENGINE HELIUM SUPPLY CHECK VALVE
(CV25,26,36,37,41,42)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: /
MDAC ID: 370 ABORT: /

ITEM: ENGINE HELIUM PRESSURE REGULATOR (PR1,2,3,7,8,9)
FAILURE MODE: FAILS TO REMAIN CLOSED

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THIS IS GENERATED IN RESPONSE TO NASA FMEA/CIL 0205-3. IOA BELIEVES THAT THIS IS NOT A CREDIBLE FAILURE MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 371 ABORT: /

ITEM: ENGINE REGULATOR OUTLET CHECK VALVE
(CV5,6,7,29,40,45)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88
SUBSYSTEM: MPS
MDAC ID: 372

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

ITEM: ENGINE HELIUM SUPPLY INTERCONNECT OUT VALVE
(LV60,62,64)
FAILURE MODE: FAILS TO REMAIN CLOSED

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 373 ABORT: /

ITEM: ENGINE HELIUM INTERCONNECT OUT CHECK VALVE
(CV28,39,44)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88
SUBSYSTEM: MPS
MDAC ID: 374

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: ENGINE HELIUM INTERCONNECT IN CHECK VALVE
(CV27,38,43)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 375 ABORT: /

ITEM: PNEUMATIC HELIUM SUPPLY CHECK VALVE (CV4)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 376 ABORT: /

ITEM: GO2 PRESSURIZATION MANIFOLD REPRESSURIZATION CHECK VALVE (CV10)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 377 ABORT: /

ITEM: LO2 FEED MANIFOLD REPRESSURIZATION CHECK VALVE (CV12)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 378 ABORT: /

ITEM: GH2 PRESSURIZATION MANIFOLD REPRESSURIZATION CHECK VALVE (CV13)
FAILURE MODE: FAIL TO REMAIN OPEN

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 379 ABORT: /

ITEM: GH2 PRESSURIZATION MANIFOLD REPRESSURIZATION CHECK VALVE (CV13)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 380 ABORT: /

ITEM: LH2 RECIRCULATION MANIFOLD REPRESSURIZATION CHECK VALVE (CV14)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 381 ABORT: /

ITEM: LH2 FEED MANIFOLD NOMINAL REPRESS CHECK VALVE (CV15)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 382 ABORT: /

ITEM: GH2 PRESSURIZATION MANIFOLD REPRESSURIZATION CHECK VALVE (CV24)
FAILURE MODE: FAIL TO REMAIN OPEN

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 383 ABORT: /

ITEM: GH2 PRESSURIZATION MANIFOLD REPRESSURIZATION CHECK VALVE (CV24)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT:
MDAC ID: 384 ABORT: /

ITEM: LH2 FEED MANIFOLD RTLS REPRESSURIZATION CHECK
VALVE (CV30)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 385 ABORT: /

ITEM: PNEUMATIC HELIUM SUPPLY ISOLATION VALVE (LV7, 8)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 386 ABORT: /

ITEM: VALVE ACTUATION SOLENOIDS DOWNSTREAM OF CV9
(LV12,14,16,18,20,22,47,49,50,65,66,67,68,79,83,84,85)
FAILURE MODE: EXTERNAL LEAKAGE THROUGH VENT PORT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 387 ABORT: /

ITEM: VALVE ACTUATION SOLENOIDS DOWNSTREAM OF CV9
(LV12,14,16,18,20,22,47,49,50,65,66,67,68,79,83,84,85)
FAILURE MODE: RUPTURE, LEAKAGE OF VALVE BODY

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 388 ABORT: /

ITEM: VALVE ACTUATION SOLENOID VALVES UPSTREAM OF CV9 (LV28,29,30,31,32,33,34,36,38,77,78)
FAILURE MODE: EXTERNAL LEAKAGE THROUGH VENT PORT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 389 ABORT: /

ITEM: VALVE ACTUATION SOLENOID VALVES UPSTREAM OF CV9 (LV28,29,30,31,32,33,34,36,38,77,78)
FAILURE MODE: RUPTURE/LEAKAGE THROUGH VALVE BODY

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/10/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 390 ABORT: /

ITEM: LH2 MANIFOLD REPRESSURIZATION VALVES (LV42, 43)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 391 ABORT: /

ITEM: LH2 RECIRCULATION DISCONNECT VALVE OPENING SOLENOID (LV50)
FAILURE MODE: PREMATURE ACTUATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 393 ABORT: /

ITEM: LATCH LOCKING SOLENOIDS (OV65, 67)
FAILURE MODE: PREMATURE DEACTUATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 394 ABORT: /

ITEM: LATCH HOOK
FAILURE MODE: FAIL TO DEACTUATE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
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9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 395 ABORT: /

ITEM: LATCH LOCK SOLENOID (LV65, 67)
FAILURE MODE: PREMATURE DEACTUATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 396 ABORT: /

ITEM: LATCH UNLOCK SOLENOID (LV66, 68)
FAILURE MODE: FAIL TO ACTUATE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 397 ABORT: /

ITEM: LATCH UNLOCK SOLENOID (LV66, 68)
FAILURE MODE: PREMATURE DEACTUATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 398 ABORT: /

ITEM: LATCH UNLOCK SOLENOID (LV66, 68)
FAILURE MODE: PREMATURE ACTUATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
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CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 399 ABORT: /

ITEM: LH2 FEED MANIFOLD RTLS PRESSURIZATION VALVE (LV74, 75)
FAILURE MODE: RUPTURE, LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 400 ABORT: /

ITEM: LO2 MANIFOLD REPRESSURIZATION REGULATOR (PR5)
FAILURE MODE: FAILS TO REMAIN CLOSED, INTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 401 ABORT: /

ITEM: TOGGLE SWITCH (3)
FAILURE MODE: FAILS TO OPEN, FAILS TO CLOSE, SHORTS TO GROUND

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 402 ABORT: /

ITEM: CLOSE RPC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 403 ABORT: /

ITEM: CLOSE RPC OUTPUT DIODE
FAILURE MODE: SHORTS

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 404 ABORT: /

ITEM: CLOSE RPC OUTPUT DIODE
FAILURE MODE: SHORTS TO GROUND

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 405

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: /

ITEM: CLOSE HDC III
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 406 ABORT: /

ITEM: CLOSE HDC I
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 407 ABORT: /

ITEM: OPEN RPC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 408 ABORT: /

ITEM: OPEN RPC OUTPUT DIODE
FAILURE MODE: SHORTS

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 409

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: /

ITEM: OPEN RPC OUTPUT DIODE
FAILURE MODE: SHORTS TO GROUND

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 410 ABORT: /

ITEM: OPEN HDC I
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 411 ABORT: /

ITEM: OPEN MDM BLOCKING DIODE
FAILURE MODE: SHORTS

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 412 ABORT: /

ITEM: CLOSE MDM BLOCKING DIODE
FAILURE MODE: SHORTS

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 413 ABORT: /

ITEM: CLOSE MDM BLOCKING DIODE
FAILURE MODE: SHORTS

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
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CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 414 ABORT: /

ITEM: OPEN SWITCH BLOCKING DIODE
FAILURE MODE: SHORTS

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
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6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 415 ABORT: /

ITEM: CLOSE SWITCH BLOCKING DIODE
FAILURE MODE: SHORTS

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 416 ABORT: /

ITEM: CLOSE SWITCH BLOCKING DIODE
FAILURE MODE: SHORTS

LEAD ANALYST: R. O'DONNELL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 PREVALVES
3)
4)
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8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 417

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LO2 TOGGLE SWITCH
FAILURE MODE: FAILURE TO TRANSFER TO OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
FAILURE CAUSES THE LOSS OF THE MANUAL CAPABILITY TO OPEN THE LO2 RELIEF VALVE. A LOSS OF ALL REDUNDANCY COULD RESULT IN MPS OVER PRESSURIZATION AND RUPTURE. SWITCH IS STANDBY REDUNDANT.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 418

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LO2 TOGGLE SWITCH
FAILURE MODE: FAIL TO XFER TO CLOSE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD ALLOW 02 TO ESCAPE INTO THE ATMOSPHERE CREATING A FIRE HAZARD. THE SWITCH IS STANDAY REDUNDANT.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 419

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LO2 TOGGLE SWITCH
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION

EFFECTS/RATIONALE:
THE LO2 RELIEF SHUTOFF VALVE WILL CLOSE BECAUSE OF THIS FAILURE. IF ALL REDUNDANCY IS LOST THE LO2 FEEDLINE MANIFOLD COULD RUPTURE. THE SWITCH IS A STANDBY REDUNDANT SYSTEM.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 420

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LO2 TOGGLE SWITCH
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION

EFFECTS/RATIONALE:
THE FAILURE WILL DISABLE THE USE OF THE FEEDLINE RELIEF ISOLATION SWITCH. A LOSS OF ALL REDUNDANCY COULD PRODUCE A FIRE HAZARD. THE SWITCH IS A STANDBY REDUNDANT SYSTEM.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 421 ABORT: 3/1R

ITEM: BLOCKING DIODE, SWITCH
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION

EFFECTS/RATIONALE:
THE FAILURE ERODES REDUNDANCY. LOSS OF ALL REDUNDANCY COULD CLOSE THE VALVE AND CAUSE A POSSIBLE RUPTURE OF THE MPS.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 422 ABORT: 3/3

ITEM: BLOCKING DIODE, MDM TO RPC
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO ADVERSE EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 423

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE RPC C OUTPUT, 12A
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD ALLOW 02 TO BE RELEASED INTO THE ATMOSPHERE.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 424

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE, RPC CROSSOVER, 12A
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD ALLOW 02 TO BE RELEASED INTO THE ATMOSPHERE.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 425 ABORT: 3/1R

ITEM: RPC A OUTPUT DIODE, 12A
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD CAUSE O2 TO BE VENT INTO THE ATMOSPHERE.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/28/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 426

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: RPC A OUTPUT DIODE, 12A
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE RELIEF SHUTOFF VALVE (PV7)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL RESULT IN THE VENTING OF 02 INTO THE ATMOSPHERE.

REFERENCES: VS72-941099 SHEET 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 427 ABORT: 3/1R

ITEM: DIODE, OP SW BLOCK (LCA)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OUTBOARD FILL & DRAIN VALVE (PV9)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS

EFFECTS/RATIONALE:
FIRST FAILURE CAUSE LOSS OF BLOCKING TO CLOSE SOLENOID INHIBIT. SECOND FAILURE - PREMATURE OPEN COMMAND WOULD APPLY POWER TO OPEN SOLENOID. THIRD FAILURE - TERMINATION OF OUTPUT TO CLOSE.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 428

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE 3 (CLOSE)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OUTBOARD FILL & DRAIN VALVE (PV9)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL ELIMINATE POWER TO CLOSE SOLENOID. SECOND FAILURE - PREMATURE POWER TO OPEN SOLENOID RESULTING IN OUTBOARD FILL DRAIN VALVE OPENING. THIRD FAILURE - OPENING OF INBOARD FILL DRAIN/VALVE CREATING FIRE HAZARD.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 429 ABORT: 3/3

ITEM: DIODE, LA1 MDM ISOLATION
FAILURE MODE: SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OUTBOARD FILL & DRAIN VALVE (PV9)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS

EFFECTS/RATIONALE:
FAILURE WILL CAUSE LACK OF BLOCKING BETWEEN MDM (LA1) AND THE OPEN SOLENOID CIRCUIT. NO REDUCTION IN REDUNDANCY AND NO ADVERSE AFFECTS.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 430 ABORT: 3/3

ITEM: DIODE, OP SW BLOCK (MODULE)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OUTBOARD FILL & DRAIN VALVE (PV9)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FALIURE ELIMINATES BLOCKING BETWEEN OPEN SOLENOID CIRCUITRY AND SWITCH. NO ADVERSE AFFECTS.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 431

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

ITEM: DIODE, OPEN MDM ISOLATION
FAILURE MODE: SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OUTBOARD FILL & DRAIN VALVE (PV9)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE ELIMINATES BLOCKING BETWEEN MDM (FA4) AND THE OPEN SOLENOID. NO ADVERSE AFFECTS.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 432 ABORT: 3/3

ITEM: TRANSIENT SUPPRESSION DIODE
FAILURE MODE: SHORTS, OPENS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OUTBOARD FILL & DRAIN VALVE (PV9)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE CAUSES LOSS OF REDUNDANCY. SECOND FAILURE - LOSS OF DIODE IN OPEN SOLENOID HDC WOULD RESULT IN LOSS OF POWER TO OPEN SOLENOID. THIRD FAILURE - PREMATURE CLOSE SOLENOID POWER WOULD CLOSE THE OUTBOARD FILL/DRAIN VALVE. IF THIS FAILURE OCCURS DURING FAST FILL, THERE WILL BE A SUDDEN PRESSURE SPIKE IN THE LINE CREATING POSSIBLE RUPTURE AND FIRE HAZARD.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 433

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LO2 INBOARD FILL & DRAIN TOGGLE SWITCH
FAILURE MODE: SHORTS TO GROUND, CLOSED CONTACT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 INBOARD FILL & DRAIN VALVE (PV10)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST EFFECT IS LOSS OF REDUNDANCY FOR CLOSE SOLENOID POWER. LOSS OF EITHER MDM (FA2) BLOCKING DIODE WILL RESULT IN LOSS OF CLOSE SOLENOID POWER. PREMATURE OPEN COMMAND WILL OPEN F/D VALVE.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 434 ABORT: 3/3

ITEM: DIODE (2), OPEN SW BLOCK (MODULE)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 INBOARD FILL & DRAIN VALVE (PV10)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS

EFFECTS/RATIONALE:
FIRST FAILURE WILL ELIMINATE THE GROUND OPEN COMMAND. SECOND FAILURE (GROUNDING OF CLOSE COMMAND PATH) POSSIBLY BY SWITCH FAILURE WILL PREMATURELY CLOSE THE F/D VALVE. IF THIS FAILURE OCCURS DURING FAST FILL, THERE WILL BE A PRESSURE SPIKE IN THE LINES. THE WORST CASE IS THE RUPTURE OF ORBITER AND/OR GSE FACILITY LINES. THE RESULTS COULD BE AFT FUSELAGE OVERPRESSURIZATION AND FIRE HAZARD IN THE ORBITER AND ON THE PAD.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 435 ABORT: 3/3

ITEM: DIODE (3A), OPEN BLOCK A (LCA)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 INBOARD FILL & DRAIN VALVE (PV10)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS

EFFECTS/RATIONALE:
THE FIRST FAILURE (OPEN SWITCH BLOCKING DIODE SHORTING) WILL CAUSE TEH OPEN CMD A TO INHIBIT POWER TO THE CLOSE SOLENOID. SECOND FAILURE (LOSS OF GND OPEN) WILL ELIMINATE POWER TO OPEN SOLENOID. THIRD FAILURE (PREMATURE CLOSE COMMAND) WOULD CLOSE THE F/D VALVE. IF THIS FAILURE OCCURS DURING FAST FILL, THERE WILL BE A PRESSURE SPIKE IN THE LINES. THE WORST CASE IS THE RUPTURE OF ORBITER AND/OR GSE FACILITY LINES. THE RESULTS COULD BE AFT FUSELAGE OVERPRESSURIZATION AND FIRE HAZARD IN THE ORBITER AND ON THE PAD.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 436

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 3/3

ITEM: DIODE (3A), OPEN SW BLOCK B (LCA)
FAILURE MODE: SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 INBOARD FILL & DRAIN VALVE (PV10)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS

EFFECTS/RATIONALE:
FAILURE WILL ELIMINATE POWER TO THE OPEN SOLENOID. PREMATURE CLOSE COMMAND WILL CAUSE F/D VALVE TO CLOSE. IF THIS FAILURE OCCURS DURING FAST FILL, THERE WILL BE A PRESSURE SPIKE IN THE LINES. THE WORST CASE IS THE RUPTURE OF ORBITER AND/OR GSE FACILITY LINES. THE RESULTS COULD BE AFT FUSELAGE OVERPRESSURIZATION AND FIRE HAZARD IN ORBITER AND ON PATH.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 437 ABORT:4824H3/3

ITEM: DIODE (3A), FA1 MDM BLOCK
FAILURE MODE: SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 INBOARD FILL & DRAIN VALVE (PV10)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL ELIMINATE BLOCKING PROTECTION BETWEEN MDM (FA1) AND HDC TYPE 3. NO ADVERSE AFFECT.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 438

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

ITEM: DIODE (3A), FA4 MDM BLOCK
FAILURE MODE: SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 INBOARD FILL & DRAIN VALVE (PV10)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL ELIMINATE BLOCKING PROTECTION BETWEEN MDM (FA4) AND OPEN SOLENOID CIRCUITRY. NO ADVERSE AFFECT.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 439 ABORT: 3/3

ITEM: DIODE (3A), CL SW BLOCK
FAILURE MODE: SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 INBOARD FILL & DRAIN VALVE (PV10)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/3
LIFTOFF:	3/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE ELIMINATES BLOCKING BETWEEN CLOSE COMMAND AND OPEN SOLENOID INHIBIT. SECOND FAILURE - SWITCH FAILS, GROUNDING CLOSE CMD AND INTERRUPTING CLOSE COMMAND POWER. THIRD FAILURE, PREMATURE OPEN COMMAND. GAS TRAPPED IN LINE COULD CAUSE CAVITATION OF PUMPS ON ONE OR MORE SSME's.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 440 ABORT: 3/3

ITEM: DIODE (3A), FA2 MDM BLOCK
FAILURE MODE: SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 INBOARD FILL & DRAIN VALVE (PV10)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL ELIMINATE BLOCKING PROTECTION BETWEEN MDM (FA2) AND CLOSE SOLENOID CIRCUITRY. NO ADVERSE AFFECT.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 441 ABORT: 3/3

ITEM: DIODE, LA1 MDM BLOCK
FAILURE MODE: SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 INBOARD FILL & DRAIN VALVE (PV10)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL ELIMINATE BLOCKING PROTECTION BETWEEN MDM (LA1) AND OPEN SOLENOID CIRCUITRY. NO ADVERSE AFFECT.

REFERENCES: VS72-941102 SHEET 13

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 442

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE 1, CL
FAILURE MODE: FAIL OFF

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD LEAD TO L02 17 INCH DISCONNECT VALVE NOT CLOSING. ADDITIONAL FAILURES COULD LEAD TO ORBITER/ET COLLISION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 443 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE 1, OP
FAILURE MODE: FAIL OFF

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF REDUNDANT PATH TO OPEN SOLENOID. LOSS OF ALL REDUNDANCY COULD RESULT IN VALVE CLOSURE WHILE SSME'S ARE RUNNING CAUSING POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 444 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE 3, CL
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD LEAD TO L02 17 INCH DISCONNECT VALVE NOT CLOSING. ADDITIONAL FAILURES COULD LEAD TO ORBITER/ET COLLISION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 15

C-5

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/19/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 445 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE 3, CL
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD LEAD TO LO2 17 INCH DISCONNECT VALVE NOT CLOSING. ADDITIONAL FAILURES COULD LEAD TO ORBITER/ET COLLISION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 446

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE (12A), CL RPC "B" OUT
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE CAUSES LOSS OF REDUNDANT BLOCKING PROTECTION. SECOND FAILURE (SERIES RPC BLOCKING DIODE SHORTS) RESULTING IN PARALLEL RPC HAVING ITS OUTPUT TIED TO GROUND. CURRENT LIMIT WILL TRIP ELIMINATING POWER TO CLOSE SOLENOID. LOSS OF ALL REDUNDANCY COULD RESULT IN VALVE CLOSURE WHILE SSME'S ARE RUNNING CAUSING POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 447 ABORT: 3/1R

ITEM: DIODE (12A), CL RPC "B" OUT
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
P-TERMINAL OF DIODE WOULD SHORT TO GROUND. THIS WOULD ELIMINATE A REDUNDANT PATH FOR OPEN SOLENOID POWER. LOSS OF ALL REDUNDANCY COULD RESULT IN VALVE CLOSURE WHILE SSME'S ARE RUNNING CAUSING POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 448 ABORT: 3/1R

ITEM: DIODE (12A), CL XOVER
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF REDUNDANCY AGAINST APPLYING CLOSE SOLENOID POWER. LOSS OF ALL REDUNDANCY COULD RESULT IN VALVE CLOSURE WHILE SSME'S ARE RUNNING CAUSING POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/19/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 1/1
MDAC ID: 449 ABORT: 1/1

ITEM: DIODE (12A), CL XOVER
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) HYDROGEN FEED SYSTEM
3) LH2 FEEDLINE DISCONNECT VALVE (PD2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	1/1	TAL:	1/1
ONORBIT:	3/2	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL CAUSE LOSS OF POWER TO THE CLOSE SOLENOID. FAILURE TO CLOSE VALVE DURING ET SEPARATION COULD CAUSE LOSS OF VEHICLE.

REFERENCES: RI DRAWING VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 450

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

ITEM: RESISTOR OP POS SW MONITOR
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF MONITORING REDUNDANCY

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 451 ABORT: 3/3

ITEM: RESISTOR CL POS SW MONITOR
FAILURE MODE: OPENS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF MONITORING REDUNDANCY

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 452

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE 3, OP
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES LOSS OF REDUNDANT POWER PATH TO THE OPEN SOLENOID. LOSS OF ALL REDUNDANCY COULD RESULT IN VALVE CLOSURE WHILE SSME'S ARE RUNNING CAUSING POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 453 ABORT: 3/1R

ITEM: HYBRID DRIVER, TYPE 3, OP
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES LOSSOF REDUNDANT POWER PATH TO THE OPEN SOLENOID. LOSS OF ALL REDUNDANCY COULD RESULT IN VALVE CLOSURE WHILE SSME'S ARE RUNNING CAUSING POSSIBLE MPS RUPTURE AND FIRE.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 454 ABORT: 3/1R

ITEM: DIODE CL RPC "C" OUT (12A)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL ELIMINATE BLOCKING PROTECTION TO RPC "C". A SECOND FAILURE (RPC SHORT TO GROUND) WILL ELIMIANTE CLOSE SOLENOID POWER. LOSS OF ALL REDUNDANCY COULD LEAD TO L02 17 INCH DISCONNECT VALVE NOT CLOSING. ADDITIONAL FAILURES COULD LEAD TO ORBITER/ET COLLISION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/20/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 455 ABORT: 3/1R

ITEM: DIODE CL RPC "C" OUT (12A)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) ET/ORBITER FEED DISCONNECT VALVE (PD1)
4)
5)
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:	3/2R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECH SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL ELIMINATE REDUNDANT POWER PATH TO CLOSE SOLENOID. SECOND FAILURE WILL ELIMINATE CLOSE SOLENOID POWER. THIRD FAILURE COULD OPEN VALVE. THIS FAILURE COULD LEAD TO ORBITER/ET COLLISION AND LOSS OF VEHICLE.

REFERENCES: VS72-941102 SHEET 15

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 456 ABORT: 3/3

ITEM: HDC I-GND C/O CMD PWR
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) GO2 PRESSURE FLOW CONTROL VALVE (1 PER SSME) (LV53, LV54, & LV55)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941099 SHEET 39

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 457 ABORT: 2/1R

ITEM: HDC I-GND C/O CMD PWR
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) GO2 PRESSURE FLOW CONTROL VALVE (1 PER SSME) (LV53, LV54, & LV55)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE ARMS THE GROUND CHECKOUT SYSTEM. A PREMATURE ALL C/O LOW SIGNAL COULD THEN CLOSE ALL FLOW CONTROL VALVES URING FLIGHT. IMPLOSION COULD RESULT FROM FLIGHT LOADS.

REFERENCES: VS72-941099 SHEET 39

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 458 ABORT: 3/1R

ITEM: TRANSIENT SUPPRESSION DIODES
FAILURE MODE: OPENS AND SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) GO2 PRESSURE FLOW CONTROL VALVE (1 PER SSME) (LV53, LV54, & LV55)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILING OPEN HAS NO EFFECT. A SHORT WOULD CAUSE A LOSS IN REDUNDANCY AGAINST PREMATURE OPENING. A SECOND FAILURE (SHORT OF INTERNAL HDC DIODE) WILL GROUND THE OUTPUT OF THE HDC AND OPEN THE VALVE. LOSS OF ALL REDUNDANCY WILL OVERPRESSURIZE THE ET.

REFERENCES: VS72-941102 SHEET 25

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 459 ABORT: 3/3

ITEM: ZENER DIODES
FAILURE MODE: OPENS AND SHORTS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) GO2 PRESSURE FLOW CONTROL VALVE (1 PER SSME) (LV53, LV54, & LV55)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEET 25

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 460 ABORT: 1/1

ITEM: HDC I-RELAY CONTROL PWR
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) GO2 PRESSURE FLOW CONTROL VALVE (1 PER SSME) (LV53, LV54, & LV55)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	1/1
LIFTOFF:	2/1R	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL OPEN ONE FLOW CONTROL VALVE PREMATURELY. A SECOND FAILURE COULD OVERPRESSURIZE THE ET. FIRST FALIURE DURING ABORTS CAN CREATE SUCH A HAZARD.

REFERENCES: VS72-941102 SHEET 25

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/27/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 461 ABORT: 3/1R

ITEM: HDC I-RELAY CONTROL PWR
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 TANK PRESSURIZATION SYSTEM
3) GH2 PRESSURE FLOW CONTROL VALVE (1 PER SSME) (LV53, LV54, & LV55)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE CAUSES A LOSS OF REDUNDANCY. FAILURE OF A PRESSURE TRANSDUCER WOULD CAUSE A SWITCH TO THE STANDBY TRANSDUCER. A THIRD FAILURE COULD CAUSE AN OPENING OF TWO FLOW CONTROL VALVES AND ET OVERPRESSURIZATION.

REFERENCES: VS72-941102 SHEET 26

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 462 ABORT: 1/1

ITEM: RELAY
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) GO2 PRESSURE FLOW CONTROL VALVE (1 PER SSME) (LV53, LV54, & LV55)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	1/1
LIFTOFF:	2/1R	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL OPEN ONE FLOW CONTROL VALVE PREMATURELY. A SECOND FAILURE COULD OVERPRESSURIZE THE ET. FIRST FAILURE DURING ABORTS CAN CREATE SUCH A HAZARD.

REFERENCES: VS72-941102 SHEET 25

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/26/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 463 ABORT: 2/1R

ITEM: RELAY
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) GO2 PRESSURE FLOW CONTROL VALVE (1 PER SSME) (LV53, LV54, & LV55)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THIS FAILURE WOULD CLOSE ONE SOLENOID. A SECOND FAILURE COULD CLOSE A SECOND VALVE. LOW ULLAGE PRESSURE COULD CAUSE IMPLOSION DUE TO FLIGHT LOADS.

REFERENCES: VS72-941102 SHEE 25

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/08/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 464

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

ITEM: HDC III
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) L02 POGO ACCUMULATOR RECIRCULATION VALVE (2) (PV20, PV21)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL OPEN A L02 POGO ACCUM VALVE. THIS WILL CAUSE A LAUNCH DELAY, BUT WILL NOT CREATE A HAZARD.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 465 ABORT: 3/3

ITEM: CL HDC III
FAILURE MODE: PREMATURE OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OVERBOARD BLEED VALVE (PV19)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL HAVE NO EFFECT. A SECOND FAILURE COULD CLOSE THE LO2 OVBD BLEED VALVE DURING PRELAUNCH ACTIVITIES. THIS COULD CAUSE A GEYSER EFFECT CREATING A FIRE AND EXPLOSION HAZARD ON THE PAD.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 466 ABORT: 3/3

ITEM: CL HDC III
FAILURE MODE: PREMATURE OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OVERBOARD BLEED VALVE (PV19)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL HAVE NO EFFECT. A SECOND FAILURE COULD CLOSE THE LO2 OVBD BLEED VALVE DURING PRELAUNCH ACTIVITIES. THIS COULD CAUSE A GEYSER EFFECT CREATING A FIRE AND EXPLOSION HAZARD ON THE PAD.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 467 ABORT: 3/3

ITEM: CL HDC I
FAILURE MODE: PREMATURE OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OVERBOARD BLEED VALVE (PV19)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL HAVE NO EFFECT. A SECOND FAILURE COULD CLOSE THE LO2 OVBD BLEED VALVE DURING PRELAUNCH ACTIVITIES. THIS COULD CAUSE A GEYSER EFFECT CREATING A FIRE AND EXPLOSION HAZARD ON THE PAD.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 468

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 3/3

ITEM: CL RPC
FAILURE MODE: PREMATURE OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OVERBOARD BLEED VALVE (PV19)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL HAVE NO EFFECT. A SECOND FAILURE COULD CLOSE THE LO2 OVBD BLEED VALVE DURING PRELAUNCH ACTIVITIES. THIS COULD CAUSE A GEYSER EFFECT CREATING A FIRE AND EXPLOSION HAZARD ON THE PAD.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 469 ABORT: 3/3

ITEM: CL RPC
FAILURE MODE: PREMATURE OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OVERBOARD BLEED VALVE (PV19)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL HAVE NO EFFECT. A SECOND FAILURE COULD CLOSE THE LO2 OVBD BLEED VALVE DURING PRELAUNCH ACTIVITIES. THIS COULD CAUSE A GEYSER EFFECT CREATING A FIRE AND EXPLOSION HAZARD ON THE PAD.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 470

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: 2/1R

ITEM: CL RPC B OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OVERBOARD BLEED VALVE (PV19)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	1/1	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE BOTH POWER PATHS TO THE SOLENOID AND OPEN THE VALVE. THIS FAILURE DURING PRELAUNCH COULD CAUSE A LO2 SPILL ON THE LAUNCH PAD. SINCE THE LO2 BLEED DISCONNECT VALVE IS NOT CERTIFIED TO CLOSE UNDER FLOW. A FIRE HAZARD IS CREATED.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 471 ABORT: 3/1R

ITEM: XOVER DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OVERBOARD BLEED VALVE (PV19)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE A REDUNDANT POWER PATH TO THE CLOSE SOLENOID. A SECOND FAILURE AT LAUNCH COULD VENT LO2 DURING UMBILICAL SEPARATION. IF FAILURE OCCURS AFTER LIFTOFF THEN THE BLEED DISCONNECT VALVE WILL PROVIDE ADDED REDUNDANCY.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 472

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 3/1R

ITEM: CL RPC C OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OVERBOARD BLEED VALVE (PV19)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE A REDUNDANT POWER PATH TO THE CLOSE SOLENOID. A SECOND FAILURE AT LAUNCH COULD VENT LO2 DURING UMBILICAL SEPARATION. IF FAILURE OCCURS AFTER LIFTOFF THEN THE BLEED DISCONNECT VALVE WILL PROVIDE ADDED REDUNDANCY.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 473 ABORT: 3/3

ITEM: POS SW MONITOR RESISTOR
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 OVERBOARD BLEED VALVE (PV19)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEET 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 474

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK RPC (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 475 ABORT: 3/1R

ITEM: LOCK RPC (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE LOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 476

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK RPC (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 477 ABORT: 3/1R

ITEM: UNLOCK RPC (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 478

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK HDC I
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 479 ABORT: 3/1R

ITEM: LOCK HDC I
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE LOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 480

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: UNLOCK HDC I
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 481 ABORT: 3/1R

ITEM: UNLOCK HDC I
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 482

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK HDC III (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 483

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK HDC III (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE LOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 484 ABORT: 3/1R

ITEM: UNLOCK HDC III (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 485 ABORT: 3/1R

ITEM: UNLOCK HDC III (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANCY AGAINST PREMATURE POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 486 ABORT: 3/1R

ITEM: LOCK RPC C OUTPUT DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 487 ABORT: 3/1R

ITEM: LOCK RPC C OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE BLOCKING REDUNDANCY IN THE LOCK SOLENOID CIRCUIT. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 488

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK RPC C OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 489 ABORT: 3/1R

ITEM: UNLOCK RPC B OUTPUT DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/11/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 490 ABORT: 3/1R

ITEM: UNLOCK RPC B OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE BLOCKING REDUNDANCY IN THE UNLOCK SOLENOID CIRCUIT. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 491 ABORT: 3/1R

ITEM: UNLOCK RPC B OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 492

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK RPC XOVER DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER IN THE LOCK SOLENOID CIRCUIT. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 493 ABORT: 3/1R

ITEM: LOCK RPC XOVER DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ERODES BLOCKING REDUNDANCY IN THE OPEN SOLENOID CIRCUIT. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 494 ABORT: 3/1R

ITEM: LOCK RPC XOVER DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE POWER TO THE OPEN SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 495 ABORT: 3/1R

ITEM: UNLOCK RPC XOVER DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 496 ABORT: 3/1R

ITEM: UNLOCK RPC XOVER DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE BLOCKING REDUNDANCY IN THE UNLOCK SOLENOID CIRCUIT. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 497 ABORT: 2/1R

ITEM: UNLOCK RPC XOVER DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ELIMINATE POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 498

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: TRANSIENT SUPPRESSOR DIODES (2)
FAILURE MODE: ALL

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE OF THE DIODE PLUS THE FAILURE OF AN INTERNAL HDC DIODE WILL GROUND A SOLENOID. A LOSS OF ALL REDUNDANCY COULD RESULT IN LOSS OF CREW AND VEHICLE.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 499 ABORT: 3/3

ITEM: UNLOCK POS SW MONITOR RESISTORS (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 500

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

ITEM: LOCK POS SW MON RESISTOR (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 501 ABORT: 3/3

ITEM: RPC AND SOL PWR MON RESISTORS (6)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 502

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: LOCK RPC B OUTPUT DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 503 ABORT: 3/1R

ITEM: LOCK RPC B OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ERODES BLOCKING PROTECTION IN THE LOCK SOLENOID CIRCUIT. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 504 ABORT: 3/1R

ITEM: LOCK RPC B OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN. THIS WOULD RESULT IN UNCONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 505 ABORT: 3/1R

ITEM: UNLOCK RPC C OUTPUT DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE UNLOCK SOLENOID. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTRACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 506 ABORT: 3/1R

ITEM: UNLOCK RPC C OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE BLOCKING REDUNDANCY IN THE UNLOCK SOLENOID CIRCUIT. A LOSS OF ALL ELECTRICAL AND MECHANICAL REDUNDANCY COULD CAUSE ORBITER/ET RECONTACT DURING SEPARATION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 507 ABORT: 3/1R

ITEM: UNLOCK RPC C OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE LOCK SOLENOID. A LOSS OF ALL REDUNDANCY COULD ALLOW FLAPPER CLOSURE DURING SSME BURN, THIS WOULD RESULT IN CONTAINED ENGINE DAMAGE AND EXPLOSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/12/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 508 ABORT: 3/3

ITEM: BLEED RESISTORS (4)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) O2
3) LO2 FEEDLINE DISCONNECT LATCH (PD1)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41T1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 601 ABORT: 3/3

ITEM: TOGGLE SWITCH
FAILURE MODE: FAIL TO XFER TO OFF (ALL POLES)

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) SSME CONTROLLER POWER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
SWITCH TRANSFER TO OFF IS DONE AFTER THE OMS BURN AS PART OF THE POWER DOWN SEQUENCE. FAILURE TO DO SO WILL HAVE NO HAZARDOUS EFFECT.

REFERENCES: DRAWING PPD41CD2 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 602 ABORT: 2/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) SSME CONTROLLER POWER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/1R	TAL:	2/1R
ONORBIT:	3/1R	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE LOSS OF TWO POWER SUPPLIES WILL RESULT IN THE LOSS OF AN ENGINE. CRITICALITY IS 2/1R FOR THE ABORT CASE SINCE ONE ENGINE IS ALREADY ASSUMED TO HAVE FAILED.

REFERENCES: DRAWING PPD41CD2 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 603 ABORT: 3/3

ITEM: TOGGLE SWITCH
FAILURE MODE: FAIL TO XFER TO OFF, PHASE A AND/OR PHASE B POLE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) SSME CONTROLLER POWER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
SWITCH TRANSFER TO OFF IS DONE AFTER THE OMS BURN AS PART OF THE POWER DOWN SEQUENCE. FAILURE TO DO SO WILL HAVE NO HAZARDOUS EFFECT.

REFERENCES: DRAWING PPD41CD2 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 604

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

ITEM: CIRCUIT BREAKER
FAILURE MODE: FAIL ON

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) SSME CONTROLLER POWER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE OR MISSION.

REFERENCES: DRAWING PPD41CD2 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 605

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: CIRCUIT BREAKER
FAILURE MODE: FAILS OFF

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) SSME CONTROLLER POWER
3)
4)
5)
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:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE WILL ERODE REDUNDANT POWER TO THE SSME CONTROLLERS. A LOSS OF ALL REDUNDANCY COULD SHUTDOWN ALL SSME'S.

REFERENCES: DRAWING PPD41CD2 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 606

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

ITEM: SW SCAN RESISTOR
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) SSME CONTROLLER POWER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41CD2 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 607 ABORT: 3/3

ITEM: CONTROLLER HEATER CIRCUIT
FAILURE MODE: ALL

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) CONTROLLER HEATER CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41CD3 MPS/EPDC FMEA3744HREVSEMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 615 ABORT: /NA

ITEM: TOGGLE SWITCH
FAILURE MODE: PREM XFER TO INHIBIT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LIMIT SHUTDOWN CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	/NA
LIFTOFF:	2/1R	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE WILL INHIBIT THE SHUTDOWN OF A REDLINE ENGINE. AN ENGINE FAILURE COULD RESULT IN AN EXPLOSION. NA FOR THE ABORT CASE SINCE WE ASSUME THAT AN ENGINE IS ALREADY OUT AND THE INHIBIT SWITCH HAS ALREADY TRANSFERRED TO INHIBIT.

REFERENCES: DRAWING PPD41CE1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 616

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 2/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: PREM XFER TO ENABLE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LIMIT SHUTDOWN CIRCUIT
3)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
NO HAZARDOUS EFFECT DURING A NOMINAL FLIGHT SINCE ALL SSME'S WILL BE RUNNING AND THE INHIBIT WILL ALREADY BE ENABLED BY THE GPC. FAILURE DURING AN ABORT COULD RESULT IN A SECOND ENGINE SHUTDOWN AFTER IT EXCEEDS THE REDLINE.

REFERENCES: DRAWING PPD41CE1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 617 ABORT: 2/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: FAIL TO XFER TO INHIBIT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LIMIT SHUTDOWN CIRCUIT
3)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT DURING A NOMINAL FLIGHT SINCE THERE IS NO NEED TO INHIBIT EXCEPT DURING AN ABORT. FAILURE DURING AN ABORT COULD RESULT IN A SECOND ENGINE SHUTDOWN AFTER IT EXCEEDS THE REDLINE.

REFERENCES: DRAWING PPD41CE1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 618

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: FAIL TO XFER TO ENABLE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LIMIT SHUTDOWN CIRCUIT
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT DURING A NOMINAL FLIGHT SINCE THE SWITCH IS NEVER USED. POSSIBLE LOSS OF CREW AND VEHICLE DURING AN ABORT DUE TO AN ENGINE EXCEEDING THE REDLINE AND EXPLODING.

REFERENCES: DRAWING PPD41CE1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 619

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/1R

ITEM: FUSE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LIMIT SHUTDOWN CIRCUIT
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT DURING A NOMINAL FLIGHT SINCE THE SWITCH IS NEVER USED. POSSIBLE LOSS OF CREW AND VEHICLE DURING AN ABORT DUE TO THE INABILITY TO INHIBIT A SECOND ENGINE SHUTDOWN.

REFERENCES: DRAWING PPD41CE1 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 620

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/1R

ITEM: FUSE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) SSME SHUTDOWN CIRCUIT
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON A NOMINAL FLIGHT SINCE THE SWITCH IS NEVER USED. FAILURE DURING AN ABORT COULD RESULT IN LOSS OF CREW AND VEHICLE.

REFERENCES: DRAWING PPD41CE2 MPS/EPDC FMEA REVIEW SUMMARY 817-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 621 ABORT: 3/1R

ITEM: PUSHBUTTON SWITCH
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) SSME SHUTDOWN CIRCUIT
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON A NOMINAL FLIGHT SINCE THE SWITCH IS NEVER USED. FAILURE DURING AN ABORT COULD RESULT IN LOSS OF CREW AND VEHICLE.

REFERENCES: DRAWING PPD41CE2 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 622

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 1/1

ITEM: PUSHBUTTON SWITCH
FAILURE MODE: PREMATURE CLOSURE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) SSME SHUTDOWN CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	2/1R	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE WILL SHUTDOWN ONE SSME. THE FAILURE OF ANOTHER SSME SHUTDOWN SWITCH WILL CAUSE THE LOSS OF CREW AND VEHICLE.

REFERENCES: DRAWING PPD41CE2 MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 625 ABORT: 3/3

ITEM: ALL ECO SIM OPEN CMD HDC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099, SHT. 33-37.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 626 ABORT: 3/1R

ITEM: ALL ECO SIM OPEN CMD HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD GIVE A FALSE WET INDICATION WHEN ENGINE SHUTDOWN IS REQUIRED. THIS COULD RESULT IN STARVATION CUTOFF AND LOSS OF VEHICLE.

REFERENCES: VS72-941099, SHT. 33-37.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 627 ABORT: 3/3

ITEM: ALL ECO SIM DRY CMD HDC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099, SHT. 33-37.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 628

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: ALL ECO SIM DRY CMD HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD GIVE A FALSE DRY INDICATION AND CAUSE PREMATURE ENGINE SHUTDOWN.

REFERENCES: VS72-941099, SHT. 33-37.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 629 ABORT: 3/3

ITEM: ECO SIM WET CMD 1-4 HDC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099, SHT. 33-37.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 630

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: ECO SIM WET CMD 1-4 HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD GIVE A FALSE DRY INDICATION AND CAUSE PREMATURE ENGINE SHUTDOWN.

REFERENCES: VS72-941099, SHT. 33-37.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 631

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

ITEM: LVL SENSOR SIM OPEN CMD HDC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099, SHT. 33-37.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 632 ABORT: 3/1R

ITEM: LVL SENSOR SIM OPEN CMD HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPDC/MPS
2) LEVEL SENSOR CHECKOUT
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK.

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD RESULT IN PROPELLANT UNDERLOAD.

REFERENCES: VS72-941099, SHT. 33-37.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 633 ABORT: 3/3

ITEM: LVL SENSOR SIM DRY CMD HDC
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LVL SENSOR SIM DRY CMD HDC
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099 SHEETS 33-37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 634 ABORT: 3/3

ITEM: LVL SENSOR SIM DRY CMD HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD RESULT IN OVERFILL AND A PROPELLANT SPILL. THIS WOULD CREATE A FIRE EXPLOSION HAZARD.

REFERENCES: VS72-941099 SHEETS 33-37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 635 ABORT: 3/3

ITEM: LVL SENSOR SIM WET CMD HDC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099 SHEETS 33-37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 636

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 3/3

ITEM: LVL SENSOR SIM WET CMD HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LEVEL SENSOR CHECKOUT CIRCUIT
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD RESULT IN OVERFILL AND A PROPELLANT SPILL. THIS WOULD CREATE A FIRE/EXPLOSION HAZARD.

REFERENCES: VS72-941099 SHEETS 33-37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 640 ABORT: 2/1R

ITEM: BUS 2 AND 3 UPSTREAM HDC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE LOSS OF TWO POWER SUPPLIES WILL PREVENT THE CONTROL OF ULLAGE PRESSURE. LOSS OF CREW, VEHICLE, OR MISSION COULD RESULT.

REFERENCES: VS72-941099 SHEETS 33-37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 641 ABORT: 3/3

ITEM: BUS 2 AND 3 UPSTREAM HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099 SHEETS 33, 34, 37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 642 ABORT: 2/1R

ITEM: BUS 2 AND 3 DOWNSTREAM AND BUS 1 HDC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	21R
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE LOSS OF TWO POWER SUPPLIES WILL PREVENT THE CONTROL OF ULLAGE PRESSURE. LOSS OF CREW, VEHICLE, OR MISSION COULD RESULT.

REFERENCES: VS72-941099 SHEETS 33-37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 643 ABORT: 3/3

ITEM: BUS 2 AND 3 DOWNSTREAM AND BUS 1 HDC
FAILURE MODE:

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, MISSION.

REFERENCES: VS72-941099 SHEETS 33, 34, 37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 644

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: BUS 4 RPC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD CAUSE A LOSS IN CONTROL OVER ULLAGE PRESSURE OR AN UNDERLOAD OF PROPELLANT.

REFERENCES: VS72-941099 SHEETS 33, 34, 37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 645

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

ITEM: BUS 4 RPC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099 SHEETS 33, 34, 37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 646 ABORT: 3/1R

ITEM: RPC OUTPUT DIODE
FAILURE MODE: OPENS

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD CAUSE A LOSS IN CONTROL OVER ULLAGE PRESSURE OR AN UNDERLOAD OF PROPELLANT.

REFERENCES: VS72-941099 SHEETS 33, 34, 37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 647

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: RPC OUTPUT DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
6)
7)
8)
9)

&a2520HCRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD CAUSE A LOSS IN CONTROL OVER ULLAGE PRESSURE OR AN UNDERLOAD OF PROPELLANT.

REFERENCES: VS72-941099 SHEETS 33, 34, 37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 648 ABORT: 3/1R

ITEM: RPC OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD CAUSE A LOSS IN CONTROL OVER ULLAGE PRESSURE OR AN UNDERLOAD OF PROPELLANT.

REFERENCES: VS72-941099 SHEETS 33, 34, 37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 649

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

ITEM: MONITORING RESISTOR
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099 SHEETS 33, 34, 37

4)

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 650

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

ITEM: BLEED RESISTORS
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) SIGNAL CONDITIONER POWER SUPPLY
3)

5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099 SHEETS 33, 34, 37

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 655 ABORT: 3/1R

ITEM: RPC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) FASCOS POWER
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL ELIMINATE FASCOS MONITORING. VIBRATION IN EXCESS OF 12G WILL NOT BE DETECTED. THIS COULD CAUSE LOSS OF VEHICLE.

REFERENCES: DRAWING PPD41DG MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 656

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

ITEM: RPC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) FASCOS POWER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41DG MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 657

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: HDC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) FASCOS POWER
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL ELIMINATE FASCOS MONITORING. VIBRATION IN EXCESS OF 12G WILL NOT BE DETECTED. THIS COULD CAUSE LOSS OF VEHICLE.

REFERENCES: DRAWING PPD41DG MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 658 ABORT: 3/3

ITEM: HDC
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) FASCOS POWER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41DG MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 659

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

ITEM: MONITORING RESISTOR
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) FASCOS POWER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41DG MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 660 ABORT: 3/1R

ITEM: RPC OUTPUT DIODE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) FASCOS POWER
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL ELIMINATE FASCOS MONITORING. VIBRATION IN EXCESS OF 12G WILL NOT BE DETECTED. THIS COULD CAUSE LOSS OF VEHICLE.

REFERENCES: DRAWING PPD41DG MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 661 ABORT: 3/1R

ITEM: RPC OUTPUT DIDE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) FASCOS POWER
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ELIMINATES BLOCKING REDUNDANCY AGAINST AN RPC SHORT TO GROUND. A LOSS OF ALL REDUNDANCY WILL ELIMINATE FASCOS MONITORING. VIBRATION IN EXCESS OF 12G WILL NOT BE DETECTED. THIS COULD CAUSE LOSS OF VEHICLE.

REFERENCES: DRAWING PPD41DG MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 662 ABORT: 3/1R

ITEM: RPC OUTPUT DIODE
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) FASCOS POWER
3)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL ELIMINATE FASCOS MONITORING. VIBRATION IN EXCESS OF 12G WILL NOT BE DETECTED. THIS COULD CAUSE LOSS OF VEHICLE.

REFERENCES: DRAWING PPD41DG MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 663

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

ITEM: BLEED RESISTORS
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) FASCOS POWER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE HAS NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41DG MPS/EPDC FMEA REVIEW SUMMARY

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 667 ABORT: 3/1R

ITEM: BACKUP LH2 VLV SWITCH FUSE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP CONTROL
3)
4)
5)
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:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
ONLY AVAIL REF: MPS/EPDC FMEA REVIEW SUMMARY 8-17-87. THE LH2 PROPELLANT DUMP IS CONTROLLED BY THE GPC. THREE FAILURES ARE REQUIRED TO OVERPRESSURIZE THE MANIFOLD.

REFERENCES: DRAWING PPD41AR MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 668 ABORT: 3/3

ITEM: DUMP SEQUENCE SWITCH S1
FAILURE MODE: FAIL TO XFER TO STOP

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 DUMP CONTROL
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41AR MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 2/1R
MDAC ID: 669 ABORT: 2/1R

ITEM: DUMP SEQUENCE SWITCH S1
FAILURE MODE: PREMATURE XFER TO STOP

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LO2 DUMP CONTROL
3)
4)
5)
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:	2/1R	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL INHIBIT PROPELLANT DUMP. THE SWITCH WILL OVERRIDE THE GPC.

REFERENCES: DRAWING PPD41AR MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 670

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: BACKUP LH2 VALVE SWITCH S2
FAILURE MODE: FAIL TO XFER TO OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP CONTROL
3)
4)
5)
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:	3/1R	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE LH2 PROPELLANT DUMP IS CONTROLALED BY THE GPC. THREE FAILURES ARE REQUIRED TO OVERPRESSURIZE THE MANIFOLD.

REFERENCES: DRAWING PPD41AR MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 671 ABORT: 3/3

ITEM: BACKUP LH2 VALVE SWITCH S2
FAILURE MODE: FAIL TO XFER TO CLOSE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP CONTROL
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: DRAWING PPD41AR MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 672

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: 1/1

ITEM: BACKUP LH2 VALVE SWITCH S2
FAILURE MODE: PREMATURE XFER TO OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP CONTROL
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	1/1	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A PREMATURE DUMP WOULD VENT PROPELLANT OVERBOARD DURING BOOST. THIS COULD RESULT IN FIRE/EXPLOSION. DOCUMENTATION ON ANY SOFTWARE INHIBIT WAS UNAVAILABLE.

REFERENCES: DRAWING PPD41AR MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 673

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: BACKUP LH2 VALVE SWITCH S2
FAILURE MODE: PREMATURE XFER TO CLOSE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) LH2 DUMP CONTROL
3)
4)
5)
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:	2/1R	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL INHIBIT PROPELLANT DUMP. THE SWITCH WILL OVERRIDE THE GPC.

REFERENCES: DRAWING PPD41AR MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/09/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 675 ABORT: 3/3

ITEM: LIMIT RESISTORS
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION

REFERENCES: VS72-941099 SHEET 46

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/09/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 676

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

ITEM: BLEED RESISTORS
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW, VEHICLE, OR MISSION.

REFERENCES: VS72-941099 SHEET 46

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 680

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

ITEM: STATUS LIGHT
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) MPS INSTRUMENTATION
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE PROVIDES THE CREW WITH FALSE DATA. AVAILABILITY OF CONTINGENCY OR OFF-NOMINAL CREW PROCEDURES ARE NOT CONSIDERED IN ASSIGNING CRITICALITY.

REFERENCES: DRAWING PPD41AN MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 681

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

ITEM: METER M1 (PC)
FAILURE MODE: INACCURATE OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) MPS INSTRUMENTATION
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE PROVIDES THE CREW WITH FALSE DATA. AVAILABILITY OF CONTINGENCY OR OFF-NOMINAL CREW PROCEDURES ARE NOT CONSIDERED IN ASSIGNING CRITICALITY.

REFERENCES: DRAWING PPD41AN MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 682

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

ITEM: METER M2 (LO2/LH2 MANF. PRESSURE)
FAILURE MODE: INACCURATE READING

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) MPS INSTRUMENTATION
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE PROVIDES THE CREW WITH FALSE DATA. AVAILABILITY OF CONTINGENCY OR OFF-NOMINAL CREW PROCEDURES ARE NOT CONSIDERED IN ASSIGNING CRITICALITY.

REFERENCES: DRAWING PPD41AN MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 683 ABORT: 3/3

ITEM: METER M4 (HELIUM PRESSURE)
FAILURE MODE: INACCURATE READING

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) MPS INSTRUMENTATION
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE PROVIDES THE CREW WITH FALSE DATA. AVAILABILITY OF CONTINGENCY OR OFF-NOMINAL CREW PROCEDURES ARE NOT CONSIDERED IN ASSIGNING CRITICALITY.

REFERENCES: DRAWING PPD41AN MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 684

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

ITEM: TOGGLE SWITCH (TANK/REG SELECT FOR METER M4)
FAILURE MODE: ALL

LEAD ANALYST: B. SAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) MPS INSTRUMENTATION
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE CAUSES A LOSS OF MONITORING CAPABILITY. AVAILABILITY OF CONTINGENCY OR OFF-NOMINAL CREW PROCEDURES ARE NOT CONSIDERED IN ASSIGNING CRITICALITY.

REFERENCES: DRAWING PPD41AN MPS/EPDC FMEA REVIEW SUMMARY 8-17-87.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 801 ABORT: 2/1R

ITEM: LH2 FEED MANIFOLD RTLS PRESS VALVES REMOTE POWER CONTROLLERS (4)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SYSTEM
3) LH2 FEED MANIFOLD RTLS PRESS VALVES (LV74, LV75)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
NO HAZARDOUS EFFECT ON A NOMINAL FLIGHT. FAILURE TO PURGE HYDROGEN DURING AN RTLS COULD CAUSE A FIRE HAZARD.

REFERENCES: VS72-941102, SHEET 20.1

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 802

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 2/1R

ITEM: LH2 FEED MANIFOLD RTLS PRESS VALVES RPC A OUTPUT DIODE (2)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SYSTEM
3) LH2 FEED MANIFOLD RTLS PRESS VALVES (LV74, LV75)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
NO HAZARDOUS EFFECT ON A NOMINAL FLIGHT. FAILURE TO PURGE HYDROGEN DURING AN RTLS WILL CAUSE A FIRE HAZARD.

REFERENCES: VS72-941102, SHEET 20.1

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 803 ABORT: 2/1R

ITEM: LH2 FEED MANIFOLD RTLS PRESS VALVES HYBRID DRIVER CONTROLLERS (4)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SYSTEM
3) LH2 FEED MANIFOLD RTLS PRESS VALVES (LV74, LV75)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
NO HAZARDOUS EFFECT ON A NOMINAL FLIGHT. FAILURE TO PURGE HYDROGEN DURING AN RTLS WILL CAUSE A FIRE HAZARD.

REFERENCES: VS72-941102, SHEET 20.1

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 804 ABORT: 2/1R

ITEM: LH2 FEED MANIFOLD RTLS PRESS VALVES RPC C OUTPUT DIODE (2)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SYSTEM
3) LH2 FEED MANIFOLD RTLS PRESS VALVES (LV74, LV75)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
NO HAZARDOUS EFFECT ON A NOMINAL FLIGHT. FAILURE TO PURGE HYDROGEN DURING AN RTLS WILL CAUSE A FIRE HAZARD.

REFERENCES: VS72-941102, SHEET 20.1

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	2/01/88	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	EPD&C/MPS	FLIGHT:	3/3
MDAC ID:	805	ABORT:	1/1

ITEM: LH2 FEED MANIFOLD RTLS PRESS VALVES RPC C CROSSOVER DIODES (2)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SYSTEM
3) LH2 FEED MANIFOLD RTLS PRESS VALVES (LV74, LV75)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL CLOSE A LH2 RTLS REPRESS VALVE. FAILURE HAS NO HAZARDOUS EFFECT ON A NOMINAL FLIGHT. FAILURE TO PURGE HYDROGEN DURING AN RTLS WILL CAUSE A FIRE HAZARD.

REFERENCES: VS72-941102, SHEET 20.1

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 806

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 1/1

ITEM: HELIUM SUPPLY BLOWDOWN VALVES HYBRID DRIVER CONTROLLER
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SYSTEM
3) PNEUMATIC HELIUM SUPPLY BLOWDOWN VALVES (LV26, LV27)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	3/3	TAL:	1/1
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
NO HAZARDOUS EFFECT ON A NOMINAL FLIGHT. FAILURE IS CRITICALITY 1/1 DURING ABORT SINCE FAILURE TO PURGE THE AFT COMPARTMENT IS A FIRE HAZARD.

REFERENCES: VS72-941102 SHEET 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 807 ABORT: 3/1R

ITEM: HELIUM ISOLATION B VALVE TOGGLE SWITCH
FAILURE MODE: PREM XFER TO CLOSE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM SUPPLY ISOLATION "B" VALVES (LV2, 4, 6)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ERODES REDUNDANCY AGAINST A CUT-OFF OF HELIUM TO A SSME. LOSS OF ALL REDUNDANCY COULD RESULT IN AN EXPLOSION DUE TO LACK OF HELIUM PURGE OF THE HIGH PRESSURE OXIDIZER INTERMEDIATE SEAL CAVITY.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 808

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: HELIUM ISOLATION "B" VALVE SWITCH BLOCKING DIODE
FAILURE MODE: SHORT

LEAD ANALYST: MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM SUPPLY ISOLATION "B" VALVES (LV2, 4, 6)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ERODES REDUNDANCY BETWEEN OPEN SOLENOID POWER PATHS. THE OPEN CONTACTS OF THE SWITCH SUBSEQUENTLY SHORTING TO GROUND WOULD ELIMINATE A POWER PATH. A LOSS OF ALL REDUNDANCY COULD RESULT IN AN EXPLOSION DUE TO LACK OF HELIUM PURGE IN A SSME.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 809 ABORT: 3/1R

ITEM: HELIUM ISOLATION "B" VALVE RPC OUTPUT DIODE (6)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM SUPPLY ISOLATION "B" VALVES (LV2, 4, 6)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
LOSS OF ALL REDUNDANCY COULD RESULT IN AN EXPLOSION DUE TO LACK OF HELIUM PURGE IN A SSME.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 810

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: HELIUM ISOLATION "A" VALVE TOGGLE SWITCH
FAILURE MODE: PREM XFER TO CLOSE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM SUPPLY ISOLATION VALVES "A" (LV2, 4, 6)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
ONLY AVAILABLE REF: MPS/EPDC FMEA REVIEW SUMMARY 8/17/87. LOSS OF ALL REDUNDANCY COULD RESULT IN AN EXPLOSION DUE TO LACK OF HELIUM PURGE IN A SSME.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/01/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 811 ABORT: 3/1R

ITEM: HELIUM ISOLATION "A" VALVE SWITCH BLOCKING DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM SUPPLY ISOLATION "A" VALVES (LV1, 3, 5)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	AORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL ELIMINATE BLOCKING PROTECTION. A CONTACT TO CONTACT SHORT IN THE SWITCH WILL ELIMINATE OPEN SOLENOID POWER. A LOSS OF ALL REDUNDANCY COULD RESULT IN AN EXPLOSION DUE TO LACK OF HELIUM PURGE IN A SSME.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 812 ABORT: 3/1R

ITEM: HELIUM ISOLATION "A" VALVE SWITCH BLOCKING DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM SUPPLY ISOLATION "A" VALVES (LV1, 3, 5)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL ELIMINATE BLOCKING PROTECTION. A CONTACT TO CONTACT SHORT IN THE SWITCH WILL ELIMINATE OPEN SOLENOID POWER. A LOSS OF ALL REDUNDANCY COULD RESULT IN AN EXPLOSION DUE TO LACK OF HELIUM PURGE IN A SSME.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 813 ABORT: 3/1R

ITEM: HELIUM ISOLATION VALVE TRANSIENT SUPPRESSION DIODES
FAILURE MODE: ALL

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM SUPPLY ISOLATION "A" VALVES (LV1, 3, 5)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
IF THE DIODE FAILS OPEN THERE IS NO EFFECT. IF THE DIODE SHORTS THEN THE OUTPUT WOULD BE GROUNDED WITH THE FAILURE OF AN INTERNAL DIODE IN THE HDC. A LOSS OF ALL REDUNDANCY COULD RESULT IN AN EXPLOSION DUE TO LACK OF HELIUM PURGE IN A SSME.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 814

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: FUSES (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM ISOLATION VALVE, REG PNL 4 (LV7, LV8)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE CAUSE THE LOSS OF MANUAL CONTROL OF THE VALVE. A LOSS OF ALL REDUNDANCY COULD RESULT IN THE LOSS OF HELIUM SUPPLY.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 815 ABORT: 2/1R

ITEM: HDC III (2)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM ISOLATION VALVE, REG PNL 4 (LV7, LV8)
4)
5)
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:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
3/3 LANDING/SAFING:			

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FAILURE CAUSES ONE PNEUMATIC HELIUM ISOLATION VALVE TO REMAIN CLOSED. A LOSS OF ALL REDUNDANCY WILL PREVENT AFT PURGE. THIS WILL HAVE NO HAZARDOUS EFFECT ON A NOMINAL MISSION, BUT COULD CAUSE A FIRE HAZARD DURING AN ABORT.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 816

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: HDC III (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM ISOLATION VALVE, REG PNL 4 (LV7, LV8)
4)
5)
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:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL OPEN ONE PNEUMATIC HELIUM ISOLATION VALVE. A LOSS OF ALL REDUNDANCY COULD RESULT IN THE LOSS OF HELIUM SUPPLY.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 817 ABORT: 2/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: FAIL TO XFER TO OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM ISOLATION VALVE, REG PNL 4 (LV7, LV8)
4)
5)
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:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ERODES REDUNDANCY FOR OPENING THE PNEUMATIC HELIUM ISOLATION VALVE. LOSS OF ALL REDUNDANCY WOULD PRECLUDE AFT PURGE. AFT PURGE IS NON-CRITICAL FOR A NOMINAL FLIGHT.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 818

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: PREM XFER TO CLOSE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM ISOLATION VALVE, REG PNL 4 (LV7, LV8)
4)
5)
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:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY COULD RESULT IN THE LOSS OF HELIUM SUPPLY.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/02/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 819 ABORT: 2/1R

ITEM: TOGGLE SWITCH
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM ISOLATION VALVE, REG PNL 4 (LV7, LV8)
4)
5)
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:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL PREVENT AFT PURGE. THIS WILL HAVE NO HAZARDOUS EFFECT ON A NOMINAL MISSION, BUT COULD CAUSE A FIRE HAZARD DURING AN ABORT.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 820 ABORT: 3/1R

ITEM: HELIUM CROSSOVER VALVE TOGGLE SWITCH
FAILURE MODE: FAILS TO XFER TO CLOSE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM CROSSOVER SOLENOID VALVE (LV10) CONTROL CIRCUIT
4) TOGGLE SWITCH (PANEL R2, S4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
ENGINE LOSS OF ALL REDUNDANCY WILL CAUSE THE SHUTDOWN OF ONE (LOSS OF MISSION). DURING AN ABORT LOSS OF AN ENGINE IS CRITICALITY 1. THE SWITCH IS STANDBY REDUNDANT. NSTS 22206 2.3.3L REQUIRES ASSIGNMENT OF 3/1R FOR FAILURES RESULTING IN AN ENGINE SHUTDOWN.

REFERENCES: VS72-941102 SHEETS 18.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 821 ABORT: 3/1R

ITEM: HELIUM CROSSOVER VALVE TOGGLE SWITCH
FAILURE MODE: PREMATURE XFER TO OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM CROSSOVER SOLENOID VALVE (LV10) CONTROL CIRCUIT
4) TOGGLE SWITCH (PANEL R2, S4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL CAUSE THE SHUTDOWN OF ONE ENGINE (LOSS OF MISSION). DURING AN ABORT LOSS OF AN ENGINE IS CRITICALITY 1. THE SWITCH IS STANDBY REDUNDANT. NSTS 22206 2.3.3L REQUIRES ASSIGNMENT OF 3/1R FOR FAILURES RESULTING IN AN ENGINE SHUTDOWN.

REFERENCES: VS72-941102 SHEETS 18.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 822 ABORT: 3/1R

ITEM: HELIUM CROSSOVER VALVE CIRCUIT HDC
FAILURE MODE: PREMATURE OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM CROSSOVER SOLENOID VALVE (LV10) CONTROL CIRCUIT
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
A LOSS OF ALL REDUNDANCY WILL CAUSE THE SHUTDOWN OF ONE ENGINE (LOSS OF MISSION). DURING AN ABORT LOSS OF AN ENGINE IS CRITICALITY 1. THE SWITCH IS STANDBY REDUNDANT. NSTS 22206 2.3.3L REQUIRES ASSIGNMENT OF 3/1R FOR FAILURES RESULTING IN AN ENGINE SHUTDOWN.

REFERENCES: VS72-941102 SHEETS 18.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 823 ABORT: 3/3

ITEM: HELIUM CROSSOVER VALVE CIRCUIT BLOCKING DIODES (2)
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM CROSSOVER SOLENOID VALVE (LV10) CONTROL CIRCUIT
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEETS 18

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 824

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

ITEM: LO2 MANIFOLD REPRESS VALVES CIRCUIT FUSE (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) LO2 MANIFOLD REPRESS VALVES (LV40, LV41)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE RESULTS IN A LOSS OF MANUAL SWITCH OPERATION. THIS WILL HAVE NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	2/04/88	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	EPD&C/MPS	FLIGHT:	1/1
MDAC ID:	825	ABORT:	1/1

ITEM: LO2 MANIFOLD REPRESS VALVES TOGGLE SWITCH
FAILURE MODE: PREM XFER TO OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) LO2 MANIFOLD REPRESS VALVES (LV40, LV41)
4) PANEL R4
5) TOGGLE SWITCH S1
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	1/1
LIFTOFF:	1/1	TAL:	1/1
ONORBIT:	3/3	AOA:	1/1
DEORBIT:	3/3	ATO:	1/1
LANDING/SAFING:	3/3		

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WOULD OPEN BOTH LV40 AND LV41. THIS WOULD CAUSE HELIUM INGESTION IN TO THE SSME's. THIS COULD CAUSE A VEHICLE EXPLOSION DURING ENGINE BURN.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 826

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: LO2 MANIFOLD REPRESS VALVES CIRCUIT HDC III (2)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) LO2 MANIFOLD REPRESS VALVES (LV40, LV41)
4)
5)
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:	3/3	AOA:	2/1R
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FIRST FAILURE WILL OPEN A LO2 HELIUM MANIFOLD REPRESS SOLENOID. A SECOND FAILURE IN THE OTHER LO2 HELIUM MANIFOLD REPRESS SOLENOID WILL ALLOW HELIUM INGESTION IN THE SSME's AND POSSIBLE EXPLOSION.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 827 ABORT: 3/3

ITEM: LO2 MANIFOLD REPRESS VALVES CIRCUIT MDM OA3
FAILURE MODE: FAIL OFF

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) LO2 MANIFOLD REPRESS VALVES (LV40, LV41)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 828

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

ITEM: LH2 MANIFOLD REPRESS VALVES CIRCUIT FUSE
FAILURE MODE: OPEN

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) LH2 MANIFOLD REPRESS VALVES (LV42, LV43)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE RESULTS IN A LOSS OF MANUAL SWITCH OPERATION. THIS WILL HAVE NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEETS 12

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 829 ABORT: 3/3

ITEM: LH2 MANIFOLD REPRESS VALVES TOGGLE SWITCH
FAILURE MODE: FAIL TO OPERATE, SHORT TO GROUND, XFER TO CLOSE

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) LH2 MANIFOLD REPRESS VALVES (LV42, LV43)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 830 ABORT: 3/3

ITEM: LH2 MANIFOLD REPRESS VALVES CIRCUIT HDC III (2)
FAILURE MODE: FAIL OFF

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) LH2 MANIFOLD REPRESS VALVES (LV42, LV43)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL PREVENT REPRESSURIZATION FOR LANDING, BUT COULD NOT CAUSE LOSS OF VEHICLE OR CREW.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 831 ABORT: 3/3

ITEM: LH2 MANIFOLD REPRESS VALVES CIRCUIT MONITOR MDM OA2
FAILURE MODE: FAIL OFF

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) LH2 MANIFOLD REPRESS VALVES (LV42, LV43)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW OR VEHICLE.

REFERENCES: VS72-941102 SHEETS 20

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 832 ABORT: 3/1R

ITEM: TRANSIENT SUPPRESSION DIODE
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) PNEUMATIC HELIUM SUPPLY
3) PNEUMATIC HELIUM CROSSOVER SOLENOID VALVE (LV10) CONTROL CIRCUIT
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
FIRST FAILURE ERODES REDUNDANCY. A SECOND FAILURE WITHIN THE HDC WILL GROUND THE SOLENOID AND PREVENT THE CROSSOVER VALVE FROM OPENING.

REFERENCES: VS72-941102 SHEET 18

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 833 ABORT: 3/1R

ITEM: TOGGLE SWITCH, 2P3T (3)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM INTERCONNECT INLET VALVES (LV59, 61, 63)
4) AV BAY 4, 5, 6
5) ALCA 1, 2, 3
6) MPCA 1, 2, 3
7) PANEL R2
8) TOGGLE SWITCH (S9, 10, 11)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WOULD RESULT IN THE LOSS OF ONE ENGINE (LOSS OF MISSION) IF ALL REDUNDANCY WERE LOST. THE SWITCH IS STANDBY REDUNDANT. NSTS 22206 2.3.3L REQUIRES ASSIGNMENT OF 3/1R FOR FAILURES RESULTING IN AN ENGINE SHUTDOWN.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 834

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

ITEM: HYBRID DRIVER, TYPE I (6)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM INTERCONNECT INLET VALVES (LV59, 61, 63)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE COULD INHIBIT THE ABILITY TO CLOSE THE VALVE. THIS WILL CREATE NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/3
MDAC ID: 835 ABORT: 3/3

ITEM: REMOTE POWER CONTROLLER (6)
FAILURE MODE: INADVERTENT OUTPUT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM INTERCONNECT INLET VALVES (LV59, 61, 63)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE COULD INHIBIT THE ABILITY TO CLOSE THE VALVE. THIS WILL CREATE NO HAZARDOUS EFFECT.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/04/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 836

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: ISOLATION DIODES (6)
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM INTERCONNECT INLET VALVES (LV59, 61, 63)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WOULD RESULT IN THE LOSS OF ONE ENGINE (LOSS OF MISSION) IF ALL REDUNDANCY WERE LOST. NSTS 22206 2.3.3L REQUIRES ASSIGNMENT OF 3/1R FOR FAILURES RESULTING IN AN ENGINE SHUTDOWN.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: EPD&C/MPS FLIGHT: 3/1R
MDAC ID: 837 ABORT: 3/1R

ITEM: ISOLATION DIODES
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM INTERCONNECT INLET VALVES (LV59, 61, 63)
4)
5)
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:	3/3	AOA:	3/1R
DEORBIT:	3/3	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE ERODES BLOCKING REDUNDANCY FOR OPEN SOLENOID POWER. AN INTERNAL SWITCH SHORT TO GROUND COULD ELIMINATE THE ABILITY TO OPEN THE "IN" SOLENOID. THE LOSS OF ONE ENGINE IS POSSIBLE. NSTS 22206 2.3.3L REQUIRES ASSIGNMENT OF 3/1R FOR FAILURES RESULTING IN AN ENGINE SHUTDOWN.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/05/88
SUBSYSTEM: EPD&C/MPS
MDAC ID: 838

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

ITEM: ISOLATION DIODES
FAILURE MODE: SHORT

LEAD ANALYST: B. SLAUGHTER SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1) EPD&C/MPS
2) ENGINE HELIUM SYSTEM
3) HELIUM INTERCONNECT INLET VALVES (LV59, 61, 63)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL SHOCK

EFFECTS/RATIONALE:
THE FAILURE WILL HAVE NO HAZARDOUS EFFECT ON CREW/VEHICLE.

REFERENCES: VS72-941102 SHEETS 17, 18, 19

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/03/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 901 ABORT: /

ITEM: LO2 MANIFOLD REPRESS REGULATOR (PR5)
FAILURE MODE: SENSE PORT CLOGGED

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 902 ABORT: /

ITEM: LH2 MANIFOLD REPRESSURIZATION REGULATOR (PR6)
FAILURE MODE: FAILS TO REMAIN CLOSED, INTERNAL LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 903 ABORT: /

ITEM: PNEUMATIC HELIUM SUPPLY RELIEF VALVE (RV4)
FAILURE MODE: FAILS TO REMAIN CLOSED

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 2/1R
MDAC ID: 904 ABORT: /

ITEM: LH2 FEED MANIFOLD RTLS REPRESSURIZTION ORIFICE (RP9)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 905 ABORT: /

ITEM: PNEUMATIC HELIUM SUPPLY FILTER (FL5)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 906 ABORT: /

ITEM: ENGINE HELIUM LINE (CV25,26,36,37,41,42 TO LV1,2,3,4,5,6)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 907 ABORT: /

ITEM: ENGINE HELIUM SUPPLY LINE (LV1,2,3,4 TO PR1,2,3,7,8,9)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 908 ABORT: /

ITEM: ENGINE HELIUM SUPPLY LINE (PR1,2,3,7,8,9 TO CV5,6,7,29,40,45)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 909 ABORT: /

ITEM: ENGINE HELIUM SUPPLY LINE (CV5,6,7,29,40,45 TO SSME)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 910 ABORT: /

ITEM: HELIUM INTERCONNECT IN LINE (LV59,61,63 TO CV27,38,43)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/16/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 911 ABORT: /

ITEM: HELIUM INTERCONNECT OUT LINE (LV60,62,64 TO CV28,39,44)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: MPS
MDAC ID: 912

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: HELIUM METALLIC BOSS SEALS (K SEALS)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 1/1
MDAC ID: 913 ABORT: /

ITEM: NAFLEX HELIUM TANK SEALS (FOR TK4)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: MPS
MDAC ID: 914

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: COMBINATION HELIUM TANK SEALS (FOR TK6, 8, 10)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 915 ABORT: /

ITEM: ENGINE HELIUM SUPPLY PRESSURE TRANSDUCERS (3)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: MPS
MDAC ID: 916

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: /

ITEM: PNEUMATIC HELIUM SUPPLY PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 917 ABORT: /

ITEM: ENGINE HELIUM REGULATOR OUTLET PRESSURE TRANSDUCERS (6)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 918 ABORT: /

ITEM: PNEUMATIC HELIUM REGULATOR OUTLET PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/1R
MDAC ID: 919 ABORT: /

ITEM: HELIUM ACCUMULATOR PRESSURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

EAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: MPS
MDAC ID: 920

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: /

ITEM: ENGINE HELIUM SUPPLY TEMPERATURE TRANSDUCERS (6)
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MPS FLIGHT: 3/3
MDAC ID: 921 ABORT: /

ITEM: PNEUMATIC HELIUM SUPPLY TEMPERATURE TRANSDUCER
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: MPS
MDAC ID: 922

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: GN2 PURGE DISCONNECT (PD14)
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: MPS
MDAC ID: 923

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: GN2 PURGE LINE
FAILURE MODE: RUPTURE/LEAKAGE

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/17/88
SUBSYSTEM: MPS
MDAC ID: 924

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: /
ABORT: /

ITEM: STRUCTURAL ATTACH POINTS
FAILURE MODE: DAMAGE TO CONNECTING COMPONENT

LEAD ANALYST: W.J. MCNICOLL SUBSYS LEAD: W.J. MCNICOLL

BREAKDOWN HIERARCHY:
1)
2)
3)
4)
5)
6)
7)
8)
9)

RITICALITIES

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

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THIS WAS GENERATED IN RESPONSE TO NASA FMEA/CIL 0901-1. IOA DOES NOT THINK A FMEA/CIL IS REQUIRED.

REFERENCES:

APPENDIX F

NASA FMEA TO IOA WORKSHEET CROSS REFERENCE/RECOMMENDATIONS

This section provides a cross reference between the NASA FMEA and corresponding IOA analysis worksheet(s) included in Appendix E and MDAC Working Paper 1.0-WP-VA86001-22. The Appendix F identifies: NASA FMEA Number, IOA Assessment Number, NASA criticality and redundancy screen data, and IOA recommendations.

RESOLUTION/ISSUES/RATIONALE CODES

Code	Definition
1	IOA Issue
2	IOA recommends generating a FMEA for the subject failure mode
3	IOA recommends generating a FMEA for the subject failure mode with lower criticality and/or screens
4	IOA recommends generating a FMEA for the subject failure mode with higher criticality and/or screens
5	IOA concurs with RI/NASA reevaluation
6	IOA generated an unnecessary failure mode

APPENDIX F

NASA FMEA TO IOA WORKSHEET CROSS REFERENCE / RECOMMENDATIONS

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
	MPS-6157	3/1R	P	F	P	/				5	
	MPS-7270	/				3/1R	P	F	P	1, 4	X
	MPS-7450	3/1R	P	NA	P	3/2R	P	NA	P	1, 3	X
0110-1	MPS-4630A	1/1	NA	NA	NA	/				5	
0111-1	MPS-908X	1/1	NA	NA	NA	/				2	
0113-1	MPS-4630B	1/1	NA	NA	NA	/				5	
0114-1	MPS-4630C	1/1	NA	NA	NA	/				5	
0115-1	MPS-910X	1/1	NA	NA	NA	/				2	
0116-1	MPS-911X	1/1	NA	NA	NA	/				2	
0119-1	MPS-4640A	1/1	NA	NA	NA	2/1R	P	F	F	1, 3	X
0122-1	MPS-4640B	1/1	NA	NA	NA	2/1R	P	F	P	1, 3	X
0143-1	MPS-4630E	2/1R	P	F	P	/				5	
0144-1	MPS-4630F	3/3	NA	NA	NA	/				5	
0145-1	MPS-4610	2/1R	P	F	P	/				5	
0145-2	MPS-905X	1/1	NA	NA	NA	/				2	
0190-1	MPS-4630D	1/1	NA	NA	NA	/				5	
	MPS-4640D	1/1	NA	NA	NA	/				5	
0191-1	MPS-4640E	2/1R	P	F	P	1/1	NA	NA	NA	1, 3	X
0192-1	MPS-4640F	1/1	NA	NA	NA	/				5	
0193-1	MPS-4640G	2/1R	P	P	P	1/1	NA	NA	NA	1, 4	X
0194-1	MPS-4640H	3/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
	MPS-4640I	3/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
0201-1	MPS-367X	3/3	NA	NA	NA	/				2	
0201-2	MPS-3020	3/1R	P	F	F	3/1R	P	F	P	1, 3	X
0201-3	MPS-3021	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
0201-4	MPS-3021A	2/1R	P	F	P	3/1R	P	F	P	1, 3	X
0202-1	MPS-3010	3/1R	P	F	F	3/1R	P	F	P	1, 3	X
	MPS-4010	3/1R	P	F	F	3/1R	P	P	P	1, 3	X
0202-2	MPS-3011	3/3	NA	NA	NA	/				5	
	MPS-4011	3/3	NA	NA	NA	/				5	
0202-3	MPS-366X	2/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
	MPS-375X	2/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
0203-1	MPS-3050A	2/1R	P	P	P	1/1	NA	NA	NA	1, 4	X
0203-2	MPS-3050	1/1	NA	NA	NA	/				5	
0204-1	MPS-3090	3/3	NA	NA	NA	/				5	
0204-2	MPS-3090A	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
0204-3	MPS-3091	3/3	NA	NA	NA	/				5	
0204-4	MPS-3092	2/1R	P	F	P	2/2	NA	NA	NA	1, 3	X
0204-5	MPS-3092A	1/1	NA	NA	NA	/				5	
0205-1	MPS-3110	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
0205-2	MPS-3111	2/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
0205-3	MPS-3110A	2/1R	P	F	P	3/1R	P	P	P	1, 3	X
	MPS-370X	2/1R	P	F	P	/				1	X
0205-4	MPS-3112	1/1	NA	NA	NA	/				5	
0206-1	MPS-3120	2/1R	P	F	P	1/1	NA	NA	NA	1, 4	X

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0206-1	MPS-3121	2/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
0206-2	MPS-3122	2/1R	P	NA	P	/				5	
0206-3	MPS-3120A	3/3	NA	NA	NA	1/1	NA	NA	NA	1, 4	X
0206-4	MPS-3123	1/1	NA	NA	NA	/				5	
0207-1	MPS-3141	3/3	NA	NA	NA	/				5	
0207-2	MPS-3140	2/1R	F	F	P	3/3	NA	NA	NA	1, 3	X
0207-3	MPS-371X	1/1	NA	NA	NA	/				2	
0208-1	MPS-4140	3/1R	P	F	P	/				5	
0208-2	MPS-4142	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0208-3	MPS-4140A	1/1	NA	NA	NA	/				5	
0209-1	MPS-4030	2/1R	P	F	P	3/3	NA	NA	NA	1, 3, 4	X
0209-2	MPS-4031	2/1R	P	F	P	3/1R	P	P	P	1, 3	X
0209-3	MPS-4030A	1/1	NA	NA	NA	/				5	
0210-2	MPS-4580	1/1	NA	NA	NA	/				5	
	MPS-4590	1/1	NA	NA	NA	/				5	
0215-1	MPS-4320	3/3	NA	NA	NA	/				5	
0215-2	MPS-4322	1/1	NA	NA	NA	2/1R	P	F	P	1, 3	X
0215-4	MPS-391X	2/1R	P	F	P	/				2	
0215-5	MPS-4321	2/1R	P	F	P	3/1R	P	F	P	1, 3	X
0216-1	MPS-4330	3/3	NA	NA	NA	2/1R	P	F	P	1, 4	X
0216-2	MPS-4332	3/3	NA	NA	NA	/				5	
0216-4	MPS-4332A	2/1R				3/1R	P	F	P	1, 3	X
0216-5	MPS-4331	2/1R	P	F	P	/				5	
0217-1	MPS-4300	3/3	NA	NA	NA	/				5	
0217-2	MPS-4302	1/1	NA	NA	NA	2/1R	P	F	P	1, 3	X
0217-4	MPS-4301	3/1R	P	F	P	/				5	
0217-5	MPS-4302A	3/1R	P	F	P	/				5	
0218-1	MPS-4310	2/1R	P	F	P	/				5	
0218-2	MPS-4312	3/3	NA	NA	NA	/				5	
0218-4	MPS-4312A	3/1R	P	F	P	/				5	
0218-5	MPS-4311	3/1R	P	F	P	/				5	
0219-1	MPS-4280	3/3	NA	NA	NA	/				5	
0219-2	MPS-4282	1/1	NA	NA	NA	2/1R	P	F	P	1, 3	X
0219-4	MPS-4281	3/1R	P	F	P	/				5	
0219-5	MPS-4282A	3/1R	P	F	P	/				5	
0220-1	MPS-4290	2/1R	P	F	P	/				5	
0220-2	MPS-4292	3/3	NA	NA	NA	/				5	
0220-4	MPS-4292A	3/1R	P	F	P	/				5	
0220-5	MPS-4291	2/1R	P	F	P	/				5	
0221-1	MPS-4200	3/1R	P	P	P	/				5	
0221-2	MPS-4202	3/3	NA	NA	NA	/				5	
0221-4	MPS-4201	2/1R	P	F	P	/				5	
0221-5	MPS-4202A	3/1R	P	F	P	/				5	
0222-1	MPS-4210	3/3	NA	NA	NA	/				5	
0222-2	MPS-4212	3/1R	P	P	P	/				5	
0222-4	MPS-4212A	2/1R	P	F	P	/				5	
0222-5	MPS-4211	3/1R	P	F	P	/				5	
0223-1	MPS-4220	3/1R	P	P	P	/				5	
0223-2	MPS-4222	3/3	NA	NA	NA	/				5	
0223-4	MPS-4222A	2/1R	P	F	P	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0223-5	MPS-4221	2/1R	P	F	P	/				5	
0224-1	MPS-4223	3/3	NA	NA	NA	/				5	
0224-2	MPS-4225	3/1R	P	P	P	/				5	
0224-4	MPS-4224	1/1	NA	NA	NA	/				5	
0224-5	MPS-4225A	2/1R	P	F	P	/				5	
0225-1	MPS-4150	3/1R	P	P	P	/				5	
	MPS-4410	3/1R	P	P	P	/				5	
0225-2	MPS-4152	2/1R	P	F	P	/				5	
	MPS-4412	2/1R	P	F	P	/				5	
0225-4	MPS-4151	2/1R	P	F	P	/				5	
	MPS-4411	2/1R	P	F	P	/				5	
0225-5	MPS-4152A	3/1R	P	F	P	2/1R	P	F	P	1, 4	X
	MPS-4412A	3/1R	P	F	P	2/1R	P	F	P	1, 4	X
0226-1	MPS-4160	2/1R	P	F	P	/				5	
	MPS-4400	2/1R	P	F	P	/				5	
0226-2	MPS-4162	3/1R	P	P	P	/				5	
	MPS-4402	3/1R	P	P	P	/				5	
0226-4	MPS-4162A	3/1R	P	F	P	2/1R	P	F	P	1, 4	X
	MPS-4402A	2/1R	P	F	P	/				5	
0226-5	MPS-4161	2/1R	P	F	P	/				5	
	MPS-4401	2/1R	P	F	P	/				5	
0227-1	MPS-4164	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
0227-2	MPS-4166	2/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
0227-4	MPS-4165	2/1R	P	F	P	/				5	
0227-5	MPS-4166A	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0228-1	MPS-4167	2/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
0228-2	MPS-4169	3/1R	P	F	P	/				5	
0228-4	MPS-4169A	2/1R	P	F	P	/				5	
0228-5	MPS-4168	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0229-1	MPS-4240	3/3	NA	NA	NA	/				5	
0229-2	MPS-4242	1/1	NA	NA	NA	3/3	NA	NA	NA	1, 3	X
0229-4	MPS-4242A	1/1	NA	NA	NA	3/3	NA	NA	NA	1, 3	X
0229-5	MPS-4241	3/3	NA	NA	NA	/				5	
0230-1	MPS-4250	1/1	NA	NA	NA	2/1R	P	P	F	1, 3	X
0230-2	MPS-4252	3/3	NA	NA	NA	/				5	
0230-4	MPS-4252A	2/1R	P	F	P	/				5	
0230-5	MPS-4251	2/1R	P	F	P	/				5	
0231-1	MPS-4170	3/3	NA	NA	NA	/				5	
0231-2	MPS-4172	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
0231-4	MPS-4171	2/1R	P	F	P	/				5	
0231-5	MPS-4172A	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
0232-1	MPS-4180	3/3	NA	NA	NA	/				5	
0232-2	MPS-4182	1/1	NA	NA	NA	/				5	
0232-4	MPS-4181	2/1R	P	NA	P	/				5	
0232-5	MPS-4182A	3/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
0233-3	MPS-4190	1/1	NA	NA	NA	/				5	
0233-4	MPS-4192	2/1R	P	F	P	/				5	
0233-5	MPS-4190A	1/1	NA	NA	NA	/				5	
0234-1	MPS-4620A	2/1R	P	F	P	/				5	
0235-1	MPS-909X	1/1	NA	NA	NA	/				2	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0236-1	MPS-4630G	2/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
	MPS-4640C	2/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
0237-2	MPS-4570	1/1	NA	NA	NA	/				5	
0238-2	MPS-4130	3/1R	P	F	P	/				5	
	MPS-4131	3/1R	P	F	P	/				5	
0238-3	MPS-4132	3/3	NA	NA	NA	/				5	
0238-4	MPS-385X	1/1	NA	NA	NA	/				2	
0239-1	MPS-4530	3/1R	P	F	P	2/1R	P	P	P	1, 3, 4	X
0239-2	MPS-4531	1/1	NA	NA	NA	/				5	
0239-3	MPS-4530A	1/1	NA	NA	NA	/				5	
0241-1	MPS-4021	3/1R	P	F	P	2/1R	P	P	P	1, 4	X
0241-2	MPS-4020	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
0241-3	MPS-4021A	1/1	NA	NA	NA	/				5	
0242-1	MPS-3080	3/1R	P	F	P	/				5	
0242-2	MPS-3081	1/1	NA	NA	NA	/				5	
0243-1	MPS-4380	3/3	NA	NA	NA	/				5	
0243-2	MPS-4382	3/3	NA	NA	NA	/				5	
0243-4	MPS-4382A	2/1R	P	F	P	/				5	
0243-5	MPS-4381	3/3	NA	NA	NA	/				5	
0244-1	MPS-4370	1/1	NA	NA	NA	/				5	
0244-2	MPS-4372	3/3	NA	NA	NA	/				5	
0244-4	MPS-4371	2/1R	P	F	P	/				5	
0244-5	MPS-4372A	3/3	NA	NA	NA	/				5	
0245-1	MPS-4340	3/3	NA	NA	NA	/				1, 4	X
	MPS-4341	3/3	NA	NA	NA	/				1, 4	X
	MPS-4350	3/3	NA	NA	NA	/				1, 4	X
	MPS-4351	3/3	NA	NA	NA	/				1, 4	X
0245-2	MPS-4342	2/1R	P	F	P	/				5	
	MPS-4352	2/1R	P	F	P	/				5	
0245-3	MPS-4342A	2/1R	P	F	P	/				5	
	MPS-4352A	2/1R	P	F	P	/				5	
0246-1	MPS-4360	3/3	NA	NA	NA	/				5	
0246-2	MPS-4362	3/1R	P	F	P	/				5	
0246-3	MPS-399X	1/1	NA	NA	NA	/				2	
0247-1	MPS-4600	1/1	NA	NA	NA	/				5	
0247-2	MPS-904X	2/1R	P	F	P	/				2	
0248-1	MPS-4121	1/1	NA	NA	NA	3/3	NA	NA	NA	1, 3	X
0248-2	MPS-4120	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0248-3	MPS-384X	1/1	NA	NA	NA	/				2	
0250-1	MPS-4390	3/3	NA	NA	NA	/				5	
0250-2	MPS-4392	1/1	NA	NA	NA	2/1R	P	F	P	1, 3, 4	X
0250-4	MPS-4392A	2/1R	P	F	P	/				5	
0250-5	MPS-4391	3/3	NA	NA	NA	/				5	
0251-1	MPS-903X	1/1	NA	NA	NA	/				2	
0251-2	MPS-4560	2/1R	P	NA	P	/				5	
0251-3	MPS-4561	3/3	NA	NA	NA	/				5	
0251-4	MPS-4561A	1/1	NA	NA	NA	/				5	
0252-1	MPS-4620B	1/1	NA	NA	NA	/				5	
0253-1	MPS-906X	1/1	NA	NA	NA	/				2	
0254-1	MPS-907X	1/1	NA	NA	NA	/				2	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0255-1	MPS-4630H	1/1	NA	NA	NA	/				5	
0256-1	MPS-3040	1/1	NA	NA	NA	/				5	
0257-1	MPS-3050B	1/1	NA	NA	NA	/				5	
0258-1	MPS-3071	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
0258-2	MPS-3070	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0258-3	MPS-3070A	/				3/3	NA	NA	NA	1, 3	X
0259-4	MPS-369X	1/1	NA	NA	NA	/				2	
0259-1	MPS-3181	3/3	NA	NA	NA	/				5	
0259-2	MPS-3180	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0259-3	MPS-374X	1/1	NA	NA	NA	/				2	
0260-1	MPS-3150	1/1	NA	NA	NA	3/1R	F	F	P	1, 3	X
0260-2	MPS-3151	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0260-3	MPS-3152	3/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
0260-4	MPS-3152A	1/1	NA	NA	NA	/				5	
0261-1	MPS-3171	3/3	NA	NA	NA	/				5	
0261-2	MPS-3170	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0261-3	MPS-373X	1/1	NA	NA	NA	/				2	
0262-1	MPS-3160	3/3	NA	NA	NA	/				1, 3	X
0262-2	MPS-372X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0262-3	MPS-3162	/	NA	NA	NA	1/1	NA	NA	NA	1, 4	X
0262-4	MPS-3162A	2/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
0262-5	MPS-3161	3/3	NA	NA	NA	/				5	
0262-6	MPS-3162B	1/1	NA	NA	NA	/				5	
0263-2	MPS-393X	3/1R	P	F	P	/				2	
0263-3	MPS-394X	2/1R	P	P	P	/				2	
0263-4	MPS-395X	2/1R	P	F	P	/				2	
0264-1	MPS-396X	2/1R	P	P	P	/				2	
0264-2	MPS-397X	3/1R	P	F	P	/				2	
0264-4	MPS-398X	3/1R	P	F	P	/				2	
0270-1	MPS-4226	2/1R	P	F	P	/				5	
0270-2	MPS-4228	3/3	NA	NA	NA	/				5	
0270-4	MPS-4227	2/1R	P	F	P	/				5	
0270-5	MPS-4228A	3/1R	P	F	P	/				5	
0271-1	MPS-4229	3/3	NA	NA	NA	/				5	
0271-2	MPS-4231	2/1R	P	P	P	/				5	
0271-4	MPS-4230	3/1R	P	F	P	/				5	
0271-5	MPS-4231A	2/1R	P	F	P	/				5	
0272-1	MPS-4232	3/1R	P	P	P	/				5	
0272-2	MPS-4234	3/3	NA	NA	NA	/				5	
0272-4	MPS-4233	2/1R	P	F	P	/				5	
0272-5	MPS-4234A	2/1R	P	F	P	/				5	
0273-1	MPS-4235	3/3	NA	NA	NA	/				5	
0273-2	MPS-4237	3/1R	P	P	P	/				5	
0273-4	MPS-4236	2/1R	P	F	P	/				5	
0273-5	MPS-4237A	2/1R	P	F	P	/				5	
0290-1	MPS-3B6X	1/1	NA	NA	NA	/				2	
	MPS-4160A	1/1	NA	NA	NA	/				5	
	MPS-4167A	1/1	NA	NA	NA	/				5	
	MPS-4170A	1/1	NA	NA	NA	/				5	
	MPS-4180A	1/1	NA	NA	NA	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0290-1	MPS-4281A	1/1	NA	NA	NA	/				5	
	MPS-4301A	1/1	NA	NA	NA	/				5	
	MPS-4330A	1/1	NA	NA	NA	/				5	
	MPS-4340A	1/1	NA	NA	NA	/				5	
	MPS-4350A	1/1	NA	NA	NA	/				5	
	MPS-4370A	1/1	NA	NA	NA	/				5	
	MPS-4400A	1/1	NA	NA	NA	/				5	
0290-2	MPS-387X	1/1	NA	NA	NA	/				2	
	MPS-4160B	1/1	NA	NA	NA	/				5	
	MPS-4167B	1/1	NA	NA	NA	/				5	
	MPS-4170B	1/1	NA	NA	NA	/				5	
	MPS-4180B	1/1	NA	NA	NA	/				5	
	MPS-4281B	1/1	NA	NA	NA	/				5	
	MPS-4301B	1/1	NA	NA	NA	/				5	
	MPS-4330B	1/1	NA	NA	NA	/				5	
	MPS-4340B	1/1	NA	NA	NA	/				5	
	MPS-4350B	1/1	NA	NA	NA	/				5	
	MPS-4370B	1/1	NA	NA	NA	/				5	
	MPS-4400B	1/1	NA	NA	NA	/				5	
0291-1	MPS-388X	2/1R	P	F	P	/				2	
	MPS-4236A	2/1R	P	F	P	/				5	
0291-2	MPS-389X	2/1R	P	F	P	/				2	
	MPS-4236B	2/1R	P	F	P	/				5	
0301-10	MPS-2007	1/1	NA	NA	NA	/				5	
0301-11	MPS-282X	2/1R	P	P	P	/				2	
0301-2	MPS-2004	3/3	NA	NA	NA	/				5	
0301-3	MPS-2006	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0301-4	MPS-2002	1/1	NA	NA	NA	/				5	
0301-5	MPS-2005	1/1	NA	NA	NA	/				5	
0301-6	MPS-2003	3/1R	P	P	P	/				5	
0301-7	MPS-2001	1/1	NA	NA	NA	/				5	
0301-8	MPS-280X	3/3	NA	NA	NA	/				2	
0301-9	MPS-281X	2/1R	P	F	F	/				2	
0302-10	MPS-286X	2/1R	P	P	P	/				2	
0302-2	MPS-2014	3/3	NA	NA	NA	/				5	
0302-3	MPS-2015	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0302-4	MPS-2012	2/1R	P	F	P	/				5	
0302-5	MPS-2013	2/1R	P	F	P	/				5	
0302-6	MPS-2011	1/1	NA	NA	NA	/				5	
0302-7	MPS-284X	3/3	NA	NA	NA	/				2	
0302-8	MPS-285X	2/1R	P	F	F	/				2	
0302-9	MPS-2016	1/1	NA	NA	NA	/				5	
0303-1	MPS-1072	1/1	NA	NA	NA	/				5	
	MPS-2031	1/1	NA	NA	NA	/				5	
0303-2	MPS-218X	1/1	NA	NA	NA	/				2	
	MPS-288X	1/1	NA	NA	NA	/				2	
0303-3	MPS-219X	3/3	NA	NA	NA	/				2	
	MPS-289X	3/3	NA	NA	NA	/				2	
0303-4	MPS-220X	3/3	NA	NA	NA	/				2	
	MPS-290X	3/3	NA	NA	NA	/				2	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0303-5	MPS-221X	3/3	NA	NA	NA	/				2	
	MPS-291X	3/3	NA	NA	NA	/				2	
0303-6	MPS-1073	1/1	NA	NA	NA	/				5	
	MPS-2031A	1/1	NA	NA	NA	/				5	
0304-1	MPS-2051	2/1R	P	F	P	/				5	
	MPS-2053	2/1R	P	F	P	2/1R	P	P	P	1, 3	X
0304-11	MPS-296X	2/1R	P	F	P	2/1R	P	P	P	1, 3	X
0304-2	MPS-2052	3/3	NA	NA	NA	/				5	
0304-3	MPS-294X	3/3	NA	NA	NA	/				2	
0304-4	MPS-2054	2/1R	P	F	P	/				5	
0304-6	MPS-295X	3/3	NA	NA	NA	/				2	
0304-7	MPS-2055	1/1	NA	NA	NA	/				5	
0306-1	MPS-1252	1/1	NA	NA	NA	/				5	
	MPS-1253	1/1	NA	NA	NA	/				6	
0307-1	MPS-1254	3/3	NA	NA	NA	/				5	
0307-2	MPS-1253A	1/1	NA	NA	NA	/				5	
0308-1	MPS-2023	3/3	NA	NA	NA	/				5	
0308-2	MPS-2021	1/1	NA	NA	NA	/				5	
0309-1	MPS-2114	3/3	NA	NA	NA	/				5	
	MPS-2143	3/3	NA	NA	NA	/				5	
	MPS-2153	3/3	NA	NA	NA	/				5	
0309-2	MPS-2111	1/1	NA	NA	NA	/				5	
	MPS-2112	1/1	NA	NA	NA	/				5	
	MPS-2141	1/1	NA	NA	NA	/				5	
	MPS-2151	1/1	NA	NA	NA	/				5	
0310-1	MPS-1151	3/1R	P	P	P	/				5	
0310-10	MPS-1152	1/1	NA	NA	NA	/				5	
	MPS-1157	1/1	NA	NA	NA	/				2	
0310-11	MPS-236X	1/1	NA	NA	NA	/				5	
0310-2	MPS-1153	3/3	NA	NA	NA	/				5	
0310-3	MPS-232X	1/1	NA	NA	NA	3/3	NA	NA	NA	1, 3	X
0310-4	MPS-1155	1/1	NA	NA	NA	/				5	
0310-5	MPS-233X	1/1	NA	NA	NA	/				2	
0310-6	MPS-1151A	1/1	NA	NA	NA	/				5	
0310-7	MPS-1154	3/1R	P	F	P	/				5	
0310-8	MPS-234X	1/1	NA	NA	NA	/				2	
0310-9	MPS-235X	3/3	NA	NA	NA	/				2	
0311-1	MPS-1131	2/1R	P	F	P	3/1R	P	P	P	1, 3	X
0311-10	MPS-231X	2/1R	P	P	P	/				2	
0311-2	MPS-1133	3/3	NA	NA	NA	/				5	
0311-3	MPS-228X	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0311-4	MPS-1134	2/1R	P	F	P	/				5	
	MPS-1137	2/1R	P	F	P	/				5	
0311-5	MPS-1131A	1/1	NA	NA	NA	/				5	
0311-6	MPS-1136	3/1R	P	F	P	/				5	
0311-7	MPS-229X	2/1R	P	F	P	/				2	
0311-8	MPS-230X	3/3	NA	NA	NA	/				2	
0311-9	MPS-1132	1/1	NA	NA	NA	/				5	
	MPS-1135	1/1	NA	NA	NA	/				5	
0401-10	MPS-223X	1/1	NA	NA	NA	/				2	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0401-3	MPS-1102	1/1	NA	NA	NA	/				5	
	MPS-1107	1/1	NA	NA	NA	/				5	
0401-4	MPS-1106	1/1	NA	NA	NA	/				5	
	MPS-1108	1/1	NA	NA	NA	/				5	
0401-5	MPS-1105	3/1R	P	F	P	/				5	
0401-6	MPS-222X	3/3	NA	NA	NA	/				2	
0401-7	MPS-1104	3/1R	P	NA	P	/				5	
0401-9	MPS-1103	1/1	NA	NA	NA	/				5	
0402-10	MPS-2273	1/1	NA	NA	NA	/				5	
0402-11	MPS-325X	1/1	NA	NA	NA	/				2	
0402-3	MPS-2271	1/1	NA	NA	NA	/				5	
0402-4	MPS-2272	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0402-5	MPS-2271A	3/1R	P	F	P	/				5	
0402-6	MPS-2275	3/3	NA	NA	NA	/				5	
0402-7	MPS-324X	1/1	NA	NA	NA	2/1R	P	F	F	1, 3, 4	X
0402-8	MPS-2274	2/1R	P	F	P	/				5	
0403-1	MPS-2101	3/3	NA	NA	NA	/				5	
0403-2	MPS-2102	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0403-3	MPS-312X	3/3	NA	NA	NA	/				2	
0403-4	MPS-313X	1/1	NA	NA	NA	/				1	X
0403-6	MPS-2103	1/1	NA	NA	NA	/				5	
0403-7	MPS-314X	2/1R	P	F	P	/				2	
0404-1	MPS-2173	3/3	NA	NA	NA	/				5	
0404-2	MPS-2177	1/1	NA	NA	NA	/				5	
0404-3	MPS-315X	3/3	NA	NA	NA	/				2	
0405-1	MPS-2091	3/3	NA	NA	NA	/				5	
0405-10	MPS-2094A	1/1	NA	NA	NA	/				5	
0405-2	MPS-2092	2/1R	P	F	P	/				5	
0405-3	MPS-2094	1/1	NA	NA	NA	/				5	
0405-4	MPS-307X	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0405-6	MPS-2093	1/1	NA	NA	NA	/				5	
0405-7	MPS-308X	3/3	NA	NA	NA	/				1, 3	X
0405-8	MPS-309X	3/3	NA	NA	NA	/				2	
0405-9	MPS-310X	2/1R	P	F	P	/				2	
0406-1	MPS-1082	1/1	NA	NA	NA	/				5	
0406-2	MPS-1084	2/1R	P	F	P	/				5	
	MPS-1085	2/1R	P	F	P	/				5	
0406-3	MPS-1081A	1/1	NA	NA	NA	/				5	
0406-4	MPS-1081	3/3	NA	NA	NA	/				5	
0406-5	MPS-1083	1/1	NA	NA	NA	/				5	
0407-1	MPS-2261A	3/3	NA	NA	NA	/				5	
0407-10	MPS-321X	1/1	NA	NA	NA	2/1R	P	F	F	1, 3, 4	X
0407-11	MPS-2263A	1/1	NA	NA	NA	/				5	
0407-12	MPS-322X	1/1	NA	NA	NA	/				2	
0407-2	MPS-2261	1/1	NA	NA	NA	/				5	
0407-4	MPS-2263	1/1	NA	NA	NA	/				5	
0407-5	MPS-319X	1/1	NA	NA	NA	/				2	
0407-6	MPS-2262A	1/1	NA	NA	NA	/				5	
0407-7	MPS-2262	1/1	NA	NA	NA	/				5	
0407-9	MPS-320X	2/1R	P	F	P	/				2	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0408-1	MPS-1041A	3/3	NA	NA	NA	/				5	
0408-10	MPS-207X	1/1	NA	NA	NA	3/3	NA	NA	NA	1, 3	X
0408-11	MPS-1042A	1/1	NA	NA	NA	/				5	
0408-12	MPS-208X	1/1	NA	NA	NA	/				2	
0408-2	MPS-1041	1/1	NA	NA	NA	/				5	
	MPS-1043	1/1	NA	NA	NA	/				5	
0408-4	MPS-1042	1/1	NA	NA	NA	/				5	
	MPS-1045	1/1	NA	NA	NA	/				5	
0408-5	MPS-205X	1/1	NA	NA	NA	/				2	
0408-6	MPS-1046	1/1	NA	NA	NA	/				5	
0408-7	MPS-1044	1/1	NA	NA	NA	/				5	
0408-9	MPS-206X	2/1R	P	F	P	/				2	
0409-1	MPS-4664	3/3	NA	NA	NA	/				5	
0409-2	MPS-3190	3/3	NA	NA	NA	/				6	
	MPS-4660	3/3	NA	NA	NA	/				5	
0409-3	MPS-4662	3/3	NA	NA	NA	/				5	
0409-4	MPS-922X	1/1	NA	NA	NA	/				2	
0410-1	MPS-1201	3/3	NA	NA	NA	/				5	
	MPS-2072	3/3	NA	NA	NA	/				5	
0410-3	MPS-247X	1/1	NA	NA	NA	/				2	
	MPS-301X	1/1	NA	NA	NA	/				2	
0410-4	MPS-1202	1/1	NA	NA	NA	/				5	
	MPS-2071	1/1	NA	NA	NA	/				5	
0411-1	MPS-2161	2/1R	P	F	P	/				5	
0411-2	MPS-2162	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0411-3	MPS-2163	1/1	NA	NA	NA	/				5	
0412-1	MPS-1283	3/1R	P	F	P	/				5	
0412-2	MPS-1282	3/3	NA	NA	NA	/				5	
0412-3	MPS-1282A	2/1R	P	F	P	/				5	
0412-4	MPS-1281	1/1	NA	NA	NA	/				5	
0412-5	MPS-1281A	1/1	NA	NA	NA	/				5	
0414-1	MPS-1124	3/1R	P	P	P	/				5	
0414-2	MPS-1121	3/3	NA	NA	NA	/				5	
0414-3	MPS-1122	2/1R	P	F	P	/				5	
0414-4	MPS-225X	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0414-5	MPS-226X	3/3	NA	NA	NA	/				2	
0414-6	MPS-227X	3/3	NA	NA	NA	/				2	
0414-7	MPS-1123	1/1	NA	NA	NA	/				5	
0415-1	MPS-2303	3/3	NA	NA	NA	/				5	
0415-2	MPS-2301	1/1	NA	NA	NA	/				5	
0416-1	MPS-2293	3/3	NA	NA	NA	/				5	
0416-2	MPS-2291	1/1	NA	NA	NA	/				5	
0417-1	MPS-2313	3/3	NA	NA	NA	/				5	
0417-2	MPS-2311	1/1	NA	NA	NA	/				5	
0418-1	MPS-1264A	3/3	NA	NA	NA	/				5	
0418-2	MPS-1262A	1/1	NA	NA	NA	/				5	
0419-1	MPS-1244	3/3	NA	NA	NA	/				5	
0419-2	MPS-1242	1/1	NA	NA	NA	/				5	
	MPS-1243	1/1	NA	NA	NA	/				6	
0420-1	MPS-248X	3/3	NA	NA	NA	/				2	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0420-2	MPS-1272	1/1	NA	NA	NA	/				5	
	MPS-1273	1/1	NA	NA	NA	/				6	
0421-1	MPS-2123	3/3	NA	NA	NA	/				5	
0421-2	MPS-2121	1/1	NA	NA	NA	/				5	
0422-1	MPS-251X	1/1	NA	NA	NA	/				2	
0423-1	MPS-340X	1/1	NA	NA	NA	/				2	
0424-1	MPS-252X	1/1	NA	NA	NA	/				2	
0425-1	MPS-2134	/				3/3	NA	NA	NA	1, 2	X
0425-2	MPS-2131	1/1	NA	NA	NA	/				5	
	MPS-2132	1/1	NA	NA	NA	/				5	
0426-1	MPS-923X	1/1	NA	NA	NA	/				2	
0427-2	MPS-243X	2/1R	P	F	P	3/1R	P	F	P	1, 3	X
0427-3	MPS-244X	3/1R	P	F	F	/				2	
0427-4	MPS-1191	2/1R	P	F	P	/				5	
0427-5	MPS-1192	3/1R	P	F	F	2/1R	P	F	P	1, 3, 4	X
0428-1	MPS-256X	1/1	NA	NA	NA	/				2	
0428-2	MPS-257X	1/1	NA	NA	NA	/				1	X
0429-2	MPS-2081	1/1	NA	NA	NA	/				5	
0430-1	MPS-2081A	1/1	NA	NA	NA	/				5	
0431-1	MPS-2061	3/3	NA	NA	NA	/				5	
0431-2	MPS-2062	1/1	NA	NA	NA	/				5	
0431-3	MPS-297X	3/3	NA	NA	NA	/				2	
0431-5	MPS-300X	1/1	NA	NA	NA	/				2	
0431-6	MPS-298X	1/1	NA	NA	NA	/				1	X
0431-7	MPS-299X	3/3	NA	NA	NA	/				2	
0431-8	MPS-2063	1/1	NA	NA	NA	/				5	
0432-1	MPS-2041	1/1	NA	NA	NA	/				5	
0432-2	MPS-2042	2/1R	P	F	P	/				5	
	MPS-2043	2/1R	P	F	P	/				5	
0432-4	MPS-292X	1/1	NA	NA	NA	/				2	
0432-5	MPS-2044	3/3	NA	NA	NA	/				5	
0432-6	MPS-293X	1/1	NA	NA	NA	/				2	
0433-1	MPS-258X	1/1	NA	NA	NA	/				2	
	MPS-303X	1/1	NA	NA	NA	/				2	
0434-1	MPS-259X	1/1	NA	NA	NA	/				2	
	MPS-327X	1/1	NA	NA	NA	/				2	
0434-2	MPS-260X	1/1	NA	NA	NA	/				2	
	MPS-328X	1/1	NA	NA	NA	/				2	
0435-2	MPS-2361	1/1	NA	NA	NA	/				5	
0435-3	MPS-332X	3/3	NA	NA	NA	/				2	
0435-4	MPS-333X	1/1	NA	NA	NA	/				2	
0436-1	MPS-2341	1/1	NA	NA	NA	/				5	
0436-2	MPS-2342	2/1R	P	F	P	/				5	
0436-3	MPS-2342A	3/3	NA	NA	NA	/				5	
0436-4	MPS-2343A	1/1	NA	NA	NA	/				1	X
0436-5	MPS-2343	1/1	NA	NA	NA	/				5	
0437-1	MPS-2321	1/1	NA	NA	NA	/				5	
0437-2	MPS-2322	3/3	NA	NA	NA	/				5	
0437-3	MPS-2322A	2/1R	P	F	P	/				5	
0437-5	MPS-329X	2/1R	P	F	P	3/1R	P	F	P	1, 3	X

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0437-6	MPS-330X	3/3	NA	NA	NA	/				2	
0437-7	MPS-331X	1/1	NA	NA	NA	/				2	
0437-8	MPS-2323	1/1	NA	NA	NA	/				5	
0451-1	MPS-1021	2/1R	F	F	P	2/1R	P	F	F	1, 3, 4	X
	MPS-1022	2/1R	F	F	P	2/1R	F	F	F	1, 4	X
	MPS-1023	2/1R	F	F	P	2/1R	F	F	F	1, 4	X
	MPS-1026	2/1R	F	F	P	/				5	
	MPS-1028	2/1R	F	F	P	2/1R	F	F	F	1, 4	X
0451-2	MPS-1024	3/3	NA	NA	NA	/				5	
	MPS-1025	3/3	NA	NA	NA	3/3	P	F	P	1, 4	X
0451-3	MPS-202X	3/3	NA	NA	NA	/				2	
0451-4	MPS-203X	1/1	NA	NA	NA	/				2	
0452-1	MPS-1171	3/3	NA	NA	NA	/				5	
0452-2	MPS-1172	1/1	NA	NA	NA	/				5	
0452-3	MPS-1175	1/1	NA	NA	NA	/				5	
0452-4	MPS-1173	2/1R	P	F	P	/				5	
0452-6	MPS-238X	3/3	NA	NA	NA	/				2	
0452-7	MPS-1174	1/1	NA	NA	NA	/				5	
0452-8	MPS-239X	1/1	NA	NA	NA	/				2	
0453-1	MPS-1185	2/1R	P	F	P	/				5	
0453-2	MPS-1181	3/3	NA	NA	NA	/				1, 3	X
0453-3	MPS-1182	3/3	NA	NA	NA	/				5	
0453-4	MPS-240X	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0453-5	MPS-241X	3/3	NA	NA	NA	/				2	
0453-6	MPS-1184	3/1R	F	F	P	/				5	
0453-7	MPS-1183	1/1	NA	NA	NA	/				5	
0454-2	MPS-210X	1/1	NA	NA	NA	/				2	
0454-3	MPS-211X	2/1R	P	P	P	/				2	
0454-4	MPS-212X	2/1R	P	F	P	/				2	
0454-5	MPS-213X	2/1R	P	P	P	/				2	
0454-6	MPS-214X	1/1	NA	NA	NA	3/3	NA	NA	NA	1, 3	X
0454-7	MPS-215X	1/1	NA	NA	NA	/				2	
0454-8	MPS-216X	2/1R	P	NA	P	/				2	
0455-1	MPS-253X	1/1	NA	NA	NA	/				2	
0456-1	MPS-254X	1/1	NA	NA	NA	/				2	
0456-2	MPS-255X	/				3/1R	P	F	P	1, 4	X
0457-1	MPS-306X	1/1	NA	NA	NA	/				2	
0458-1	MPS-261X	1/1	NA	NA	NA	/				2	
0459-1	MPS-1264	3/3	NA	NA	NA	/				5	
0459-2	MPS-1262	1/1	NA	NA	NA	/				5	
	MPS-1263	1/1	NA	NA	NA	/				6	
0460-1	MPS-249X	3/3	NA	NA	NA	/				2	
0460-2	MPS-1272A	1/1	NA	NA	NA	/				5	
0461-1	MPS-341X	1/1	NA	NA	NA	/				2	
0462-1	MPS-342X	1/1	NA	NA	NA	/				2	
0462-2	MPS-343X	1/1	NA	NA	NA	/				2	
0501-1	MPS-2222	2/1R	P	F	F	/				5	
0501-2	MPS-2222A	3/1R	P	F	P	/				1	X
0501-3	MPS-2221	3/3	NA	NA	NA	/				5	
0501-4	MPS-2222B	2/1R	P	F	P	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0502-1	MPS-2181	3/3	NA	NA	NA	/				5	
0502-2	MPS-2182	2/1R	P	F	F	/				5	
0502-3	MPS-2183	1/1	NA	NA	NA	/				5	
0503-1	MPS-2211	1/1	NA	NA	NA	/				5	
0503-3	MPS-2213	1/1	NA	NA	NA	/				5	
0503-5	MPS-2212	3/3	NA	NA	NA	/				5	
0503-6	MPS-2211A	3/3	NA	NA	NA	/				5	
0503-7	MPS-2213A	1/1	NA	NA	NA	/				5	
0504-1	MPS-2201	2/1R	F	P	F	/				5	
0504-2	MPS-2202	2/1R	F	P	F	/				5	
0504-3	MPS-318X	2/1R	F	P	P	2/1R	F	P	F	1, 4	X
0504-5	MPS-2203	1/1	NA	NA	NA	/				5	
0505-1	MPS-2191	2/1R	P	F	P	/				5	
0505-2	MPS-316X	2/1R	P	NA	F	3/3	NA	NA	NA	1, 3	X
0505-3	MPS-317X	3/3	NA	NA	NA	/				2	
0505-4	MPS-2192	1/1	NA	NA	NA	/				5	
0506-1	MPS-344X	1/1	NA	NA	NA	/				2	
0507-1	MPS-262X	1/1	NA	NA	NA	/				2	
0508-1	MPS-345X	1/1	NA	NA	NA	/				2	
0509-1	MPS-263X	1/1	NA	NA	NA	/				2	
0510-1	MPS-264X	3/1R	P	F	P	2/1R	P	F	P	1, 4	X
0511-1	MPS-346X	1/1	NA	NA	NA	/				2	
0512-1	MPS-2371	3/3	NA	NA	NA	/				5	
0512-2	MPS-2372	3/3	NA	NA	NA	/				5	
0512-3	MPS-2373	1/1	NA	NA	NA	/				5	
0513-1	MPS-1053	1/1	NA	NA	NA	/				5	
0513-2	MPS-1056	3/3	NA	NA	NA	/				5	
0513-3	MPS-1052	1/1	NA	NA	NA	/				5	
0513-4	MPS-1051	3/3	NA	NA	NA	/				5	
0513-5	MPS-1053A	1/1	NA	NA	NA	/				5	
0514-1	MPS-1005	3/1R	P	F	P	1/1	NA	NA	NA	1, 4	X
0514-2	MPS-1002	2/1R	P	NA	P	3/1R	P	F	F	1, 3	X
0514-3	MPS-1004	3/3	NA	NA	NA	/				5	
0514-4	MPS-1003	1/1	NA	NA	NA	/				5	
0515-1	MPS-265X	2/1R	P	F	P	/				2	
	MPS-353X	2/1R	P	F	P	/				2	
0515-2	MPS-266X	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	
	MPS-354X	2/1R	P	F	P	/				2	
0515-3	MPS-267X	2/1R	P	F	P	/				2	
	MPS-355X	2/1R	P	F	P	/				2	
0516-1	MPS-1092	2/1R	F	F	F	1/1	NA	NA	NA	1, 3, 4	X
	MPS-2231	2/1R	F	F	F	1/1	NA	NA	NA	1, 3, 4	X
0516-2	MPS-1091	1/1	NA	NA	NA	/				5	
	MPS-2231A	1/1	NA	NA	NA	/				5	
0517-1	MPS-1062	2/1R	P	F	F	/				6	
	MPS-1063	2/1R	P	F	F	2/1R	P	F	P	1, 3	X
0517-2	MPS-1064	3/3	NA	NA	NA	/				5	
0517-3	MPS-1061	3/3	NA	NA	NA	/				5	
0517-4	MPS-1064A	2/1R	P	F	P	/				5	
0518-1	MPS-1011	3/3	NA	NA	NA	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0518-2	MPS-1012	2/1R	P	F	F	/				5	
0518-3	MPS-201X	1/1	NA	NA	NA	/				2	
0519-1	MPS-1032	2/1R	F	P	F	/				5	
0519-2	MPS-1033	2/1R	F	P	F	2/1R	P	P	P	1, 3	X
0519-3	MPS-1031	2/1R	F	P	P	/				5	
0519-4	MPS-1034	1/1	NA	NA	NA	/				5	
	MPS-1035	1/1	NA	NA	NA	/				5	
0519-5	MPS-204X	1/1	NA	NA	NA	/				2	
0520-1	MPS-347X	1/1	NA	NA	NA	/				2	
0521-1	MPS-348X	1/1	NA	NA	NA	/				2	
0522-1	MPS-268X	1/1	NA	NA	NA	/				2	
0601-1	MPS-4260	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
	MPS-4261	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0601-2	MPS-4262	3/1R	P	F	P	/				5	
0601-3	MPS-4262A	3/3	NA	NA	NA	/				5	
0601-4	MPS-4260A	1/1	NA	NA	NA	/				5	
0602-1	MPS-4540	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0602-2	MPS-4541	2/1R	P	F	P	/				5	
0602-3	MPS-400X	3/1R	P	F	P	/				2	
0602-4	MPS-4540A	1/1	NA	NA	NA	/				5	
0602-5	MPS-901X	3/1R	P	F	P	2/1R	P	F	P	1, 4	X
0603-1	MPS-4051	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0603-2	MPS-4050	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0603-3	MPS-4050A	3/3	NA	NA	NA	/				5	
0603-4	MPS-377X	1/1	NA	NA	NA	/				2	
0604-1	MPS-4640K	2/1R	P	F	P	/				5	
0605-1	MPS-4061	3/3	NA	NA	NA	/				5	
	MPS-4111	3/3	NA	NA	NA	/				5	
0605-2	MPS-378X	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
	MPS-382X	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0605-3	MPS-4060A	3/3	NA	NA	NA	/				5	
	MPS-4110A	3/3	NA	NA	NA	/				5	
0605-4	MPS-379X	2/1R	P	F	P	/				2	
	MPS-383X	1/1	NA	NA	NA	/				2	
0606-1	MPS-4270	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0606-2	MPS-4272	2/1R	P	F	P	/				5	
0606-3	MPS-4272A	3/3	NA	NA	NA	/				5	
0606-4	MPS-390X	1/1	NA	NA	NA	/				2	
0607-1	MPS-269X	1/1	NA	NA	NA	/				2	
	MPS-349X	1/1	NA	NA	NA	/				2	
0608-1	MPS-2351	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0608-2	MPS-2352	1/1	NA	NA	NA	/				5	
0609-1	MPS-1291	3/3	NA	NA	NA	/				5	
0609-2	MPS-250X	1/1	NA	NA	NA	/				2	
0626-1	MPS-360X	3/3	NA	NA	NA	/				2	
0626-10	MPS-917X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0626-11	MPS-918X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0626-12	MPS-919X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0626-2	MPS-361X	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0626-3	MPS-362X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0626-4	MPS-363X	3/3	NA	NA	NA	/				2	
0626-5	MPS-270X	3/3	NA	NA	NA	/				2	
0626-6	MPS-271X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0626-7	MPS-272X	3/3	NA	NA	NA	/				2	
0626-8	MPS-915X	3/1R	P	F	P	/				2	
0626-9	MPS-916X	3/1R	P	F	P	/				2	
0627-1	MPS-364X	2/1R	P	F	P	/				2	
0627-2	MPS-365X	3/3	NA	NA	NA	/				2	
0627-3	MPS-273X	2/1R	P	F	P	/				2	
0627-4	MPS-274X	2/1R	P	F	P	3/1R	P	F	P	1, 3	X
0627-5	MPS-275X	3/3	NA	NA	NA	3/3	NA	NA	NA	1, 3	X
0627-6	MPS-920X	3/1R	P	P	P	/				2	
0627-7	MPS-921X	3/3	NA	NA	NA	/				2	
0628-1	MPS-352X	1/1	NA	NA	NA	/				2	
0629-1	MPS-4550	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0629-2	MPS-902X	3/3	NA	NA	NA	3/1R	P	P	P	1, 4	X
0629-3	MPS-4550A	1/1	NA	NA	NA	/				5	
0629-4	MPS-4551	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0630-1	MPS-4081	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0630-2	MPS-4080	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0630-3	MPS-4080A	3/3	NA	NA	NA	/				5	
0630-4	MPS-381X	1/1	NA	NA	NA	/				2	
0631-1	MPS-4041	3/3	NA	NA	NA	/				5	
0631-2	MPS-4040	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0631-3	MPS-4040A	3/3	NA	NA	NA	/				5	
0631-4	MPS-376X	1/1	NA	NA	NA	/				2	
0632-1	MPS-4071	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0632-2	MPS-4070	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
0632-3	MPS-4070A	3/3	NA	NA	NA	/				5	
0632-4	MPS-380X	1/1	NA	NA	NA	/				2	
0633-1	MPS-4640J	2/1R	P	F	P	/				5	
0634-1	MPS-4640L	2/1R	P	F	P	/				5	
0635-1	MPS-4630J	1/1	NA	NA	NA	/				5	
0636-1	MPS-4630K	1/1	NA	NA	NA	/				5	
0637-1	MPS-4630L	1/1	NA	NA	NA	/				5	
0638-1	MPS-4630M	1/1	NA	NA	NA	/				5	
0651-2	MPS-2382	2/1R	P	F	P	/				5	
	MPS-2392	2/1R	P	F	P	/				5	
0651-3	MPS-2381	3/3	NA	NA	NA	/				5	
	MPS-2391	3/3	NA	NA	NA	/				5	
0651-4	MPS-2382A	2/1R	P	F	F	3/3	NA	NA	NA	1, 3	X
	MPS-2392A	2/1R	P	F	F	3/3	NA	NA	NA	1, 3	X
0651-5	MPS-334X	3/3	NA	NA	NA	1/1	NA	NA	NA	1, 4	X
0651-6	MPS-335X	3/3	NA	NA	NA	3/3	NA	NA	NA	1, 3	X
0651-7	MPS-336X	2/1R	P	F	F	3/3	NA	NA	NA	1, 3	X
	MPS-338X	2/1R	P	F	F	3/3	NA	NA	NA	1, 3	X
0651-8	MPS-337X	3/3	NA	NA	NA	/				2	
	MPS-339X	3/3	NA	NA	NA	/				2	
0651-9	MPS-2383	1/1	NA	NA	NA	/				5	
	MPS-2393	1/1	NA	NA	NA	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
0652-1	MPS-351X	1/1	NA	NA	NA	/				2	
0701-1	MPS-276X	1/1	NA	NA	NA	/				2	
0702-1	MPS-277X	1/1	NA	NA	NA	/				2	
0703-1	MPS-278X	1/1	NA	NA	NA	/				2	
0704-1	MPS-912X	1/1	NA	NA	NA	/				2	
0705-1	MPS-913X	1/1	NA	NA	NA	/				2	
0706-1	MPS-914X	1/1	NA	NA	NA	/				2	
0707-1	MPS-279X	1/1	NA	NA	NA	/				2	
0801-1	MPS-224X	/1R				/				1	X
0802-1	MPS-326X	/1R				/				1	X
0803-1	MPS-209X	/1R				/				1	X
0804-1	MPS-323X	/1R				/				1	X
0805-1	MPS-217X	/1R				/				1	X
0806-1	MPS-237X	/1R				/				1	X
0807-1	MPS-287X	/1R				/				1	X
0808-1	MPS-283X	/1R	NA	NA	NA	/				1	X
0901-1	MPS-924X	1/1	NA	NA	NA	/				1	X
2000-1	MPS-6023	3/1R	P	P	P	/				5	
2000-2	MPS-002X	3/1R	P	P	P	/				2	
2001-1	MPS-6024	3/1R	P	F	P	/				5	
2001-2	MPS-003X	3/1R	P	F	P	/				2	
2001-3	MPS-004X	3/1R	P	P	P	/				2	
2002-2	MPS-005X	3/1R	P	F	P	/				2	
2002-3	MPS-006X	2/1R	P	P	P	/				2	
2003-1	MPS-6022	3/1R	P	P	P	/				5	
2003-2	MPS-007X	3/1R	P	P	P	/				2	
200300-1	MPS-6051	3/3	NA	NA	NA	/				5	
2004-1	MPS-6022A	3/1R	P	F	P	/				5	
2004-2	MPS-008X	3/1R	P	F	P	/				2	
200400-1	MPS-5700A	3/3	NA	NA	NA	/				5	
2005-1	MPS-6021	3/3	NA	NA	NA	/				5	
2006-1	MPS-6021D	3/3	NA	NA	NA	/				5	
2007-1	MPS-6021E	3/3	NA	NA	NA	/				5	
2008-1	MPS-6021F	3/3	NA	NA	NA	/				5	
2009-1	MPS-6021C	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2010-1	MPS-6106	3/1R	P	NA	P	/				5	
2011-1	MPS-417X	3/1R	P	NA	P	/				2	
2011-2	MPS-418X	3/1R	P	NA	P	/				2	
2011-3	MPS-5122	2/1R	P	NA	P	/				5	
2011-4	MPS-419X	3/1R	P	NA	P	/				2	
2011-5	MPS-420X	3/1R	P	NA	P	/				2	
201100-1	MPS-6131	3/3	NA	NA	NA	/				5	
2012-1	MPS-5120	3/3	NA	NA	NA	/				5	
	MPS-6107	3/3	NA	NA	NA	/				5	
2012-2	MPS-6107A	3/1R	P	P	P	/				5	
2012B-2	MPS-5120A	3/1R	P	NA	P	3/1R	P	F	P	1, 4	X
2013-1	MPS-5139H	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-6101	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
201300-1	MPS-607X	3/3	NA	NA	NA	/				2	
2014-1	MPS-5120D	3/3	NA	NA	NA	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
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2014-1	MPS-6101A	3/3	NA	NA	NA	/				5	
2015-1	MPS-5120E	3/3	NA	NA	NA	/				5	
	MPS-6101B	3/3	NA	NA	NA	/				5	
2016-1	MPS-5120F	3/3	NA	NA	NA	/				5	
	MPS-6101C	3/3	NA	NA	NA	/				5	
2017-1	MPS-5124	3/1R	P	F	P	/				5	
	MPS-5126	3/1R	P	F	P	/				5	
2017-2	MPS-5125	3/1R	P	F	P	/				5	
	MPS-5127	3/1R	P	F	P	/				5	
2018-1	MPS-801X	3/3	NA	NA	NA	/				2	
2018-2	MPS-7590	3/1R	P	P	P	/				5	
2019-1	MPS-7580	3/3	NA	NA	NA	/				5	
2019-2	MPS-7580A	3/3	NA	NA	NA	/				5	
2019-3	MPS-802X	3/3	NA	NA	NA	/				2	
2020-1	MPS-7580B	3/3	NA	NA	NA	/				5	
2021-1	MPS-7580C	3/3	NA	NA	NA	/				5	
2022-1	MPS-7580D	3/3	NA	NA	NA	/				5	
2023-1	MPS-675X	3/3	NA	NA	NA	/				2	
2025-1	MPS-001X	3/3	NA	NA	NA	/				2	
2026-1	MPS-069X	3/3	NA	NA	NA	/				2	
	MPS-456X	3/3	NA	NA	NA	/				2	
2026-2	MPS-070X	2/1R	P	F	P	/				2	
	MPS-457X	2/1R	P	F	P	/				2	
202600-1	MPS-022X	3/3	NA	NA	NA	/				2	
	MPS-6077A	3/3	NA	NA	NA	/				5	
2027-1	MPS-640X	1/1	NA	NA	NA	2/1R	P	P	P	1, 3	X
2027-2	MPS-641X	3/3	NA	NA	NA	/				2	
2028-1	MPS-642X	1/1	NA	NA	NA	2/1R	P	F	P	1, 3	X
2028-2	MPS-643X	3/3	NA	NA	NA	/				2	
2029-1	MPS-6122	2/1R	P	P	P	/				5	
2029-2	MPS-6121	3/1R	P	F	P	/				5	
2030-1	MPS-071X	3/3	NA	NA	NA	/				2	
	MPS-5650	3/3	NA	NA	NA	/				5	
2031-1	MPS-072X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-073X	3/3	NA	NA	NA	/				2	
	MPS-458X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-459X	3/3	NA	NA	NA	/				2	
2032-1	MPS-074X	2/1R	P	P	P	/				2	
	MPS-460X	2/1R	P	P	P	/				2	
2032-2	MPS-075X	2/1R	P	F	P	3/1R	P	F	P	1, 3	X
	MPS-461X	2/1R	P	F	P	3/1R	P	F	P	1, 3	X
2033-1	MPS-076X	2/1R	P	P	P	/				2	
	MPS-462X	2/1R	P	P	P	/				2	
2033-2	MPS-077X	2/1R	P	P	P	/				2	
	MPS-463X	2/1R	P	F	P	/				2	
2034-1	MPS-078X	2/1R	P	F	P	3/1R	P	F	P	1, 3	X
	MPS-5650A	2/1R	P	F	P	3/1R	P	F	P	1, 3	X
2034-2	MPS-079X	2/1R	F	F	P	3/1R	P	F	P	1, 3	X
	MPS-5650B	2/1R	F	F	P	3/1R	P	F	P	1, 3	X
2035-1	MPS-080X	3/1R	P	NA	P	/				2	

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NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2035-2	MPS-081X	2/1R	P	NA	P	/				2	
2035-3	MPS-082X	3/1R	P	NA	P	/				2	
2036-1	MPS-083X	3/1R	P	NA	P	/				2	
2036-2	MPS-084X	3/3	NA	NA	NA	/				2	
2037-1	MPS-5505	3/1R	P	P	P	/				5	
2037-2	MPS-5501	3/3	NA	NA	NA	3/1R	P	P	P	1, 4	X
2037-3	MPS-5502	2/1R	P	P	P	/				5	
	MPS-5504	2/1R	P	P	P	/				5	
2037-4	MPS-5503	2/1R	P	P	P	/				5	
2037-5	MPS-433X	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
2038-1	MPS-6072A	2/1R	P	P	P	/				5	
2038-2	MPS-6072	3/3	NA	NA	NA	2/1R	P	P	P	1, 4	X
2038-3	MPS-6073	1/1	NA	NA	NA	/				5	
2038-4	MPS-6073A	2/1R	P	P	P	/				5	
2038-5	MPS-011X	2/1R	P	P	P	/				2	
2039-1	MPS-5139B	3/1R	P	F	P	/				5	
	MPS-6108	3/1R	P	F	P	/				5	
2039-2	MPS-040X	3/1R	P	F	P	/				2	
	MPS-5139C	3/1R	P	F	P	/				5	
2039-3	MPS-041X	3/1R	P	P	P	/				2	
	MPS-423X	3/1R	P	P	P	/				2	
2040-1	MPS-5130	3/1R	P	P	P	/				5	
	MPS-5131	3/1R	P	P	P	/				5	
2040-2	MPS-5128	3/1R	P	P	P	/				5	
	MPS-5129	3/1R	P	P	P	/				5	
2041-1	MPS-6123	3/1R	P	NA	P	/				5	
2042-1	MPS-085X	3/3	NA	NA	NA	/				2	
2043-1	MPS-086X	3/3	NA	NA	NA	/				2	
2048-1	MPS-803X	3/3	NA	NA	NA	/				2	
2048-2	MPS-7600	3/1R	P	P	P	/				5	
2049-1	MPS-7580E	3/3	NA	NA	NA	/				5	
2050-1	MPS-806X	/	-			3/3	NA	NA	NA	1, 2	X
2050-2	MPS-7480	2/1R	P	P	P	/				5	
2051-1	MPS-5506	3/1R	P	P	P	/				5	
	MPS-5507	3/1R	P	P	P	/				5	
2053-1	MPS-5513	2/1R	P	P	P	/				5	
2053-2	MPS-5511	3/1R	P	F	P	/				5	
	MPS-5512	3/1R	P	F	P	/				5	
2054A-1	MPS-6081	2/1R	P	P	P	/				5	
2054B-1	MPS-5165	3/1R	P	P	P	/				5	
2055A-1	MPS-6082A	2/1R	P	P	P	/				5	
2055A-2	MPS-6082	3/3	NA	NA	NA	/				5	
2055A-3	MPS-6083	2/1R	P	P	P	/				5	
2055A-4	MPS-6083A	2/1R	P	P	P	1/1	NA	NA	NA	1, 4	X
2055B-1	MPS-5163	3/1R	P	P	P	/				5	
2055B-2	MPS-5161	3/3	NA	NA	NA	/				5	
2055B-3	MPS-5162	2/1R	P	P	P	/				5	
2055B-4	MPS-5164	2/1R	P	P	P	/				5	
2056A-1	MPS-6086	2/1R	P	P	P	/				5	
2056A-2	MPS-024X	3/1R	P	F	P	/				2	

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NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2056B-1	MPS-5170	3/1R	P	F	P	/				5	
2056B-2	MPS-427X	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
2057A-1	MPS-6084	2/1R	P	P	P	/				5	
2057A-2	MPS-6085	3/1R	P	P	P	/				5	
2057B-1	MPS-5168	2/1R	P	P	P	/				5	
2057B-2	MPS-5166	3/1R	P	P	P	/				5	
	MPS-5167	3/1R	P	P	P	/				5	
205BA-1	MPS-6084A	3/1R	P	P	P	/				5	
205BA-2	MPS-6085A	2/1R	P	P	P	/				5	
2058B-1	MPS-428X	3/1R	P	P	P	/				2	
2058B-2	MPS-5169	2/1R	P	P	P	/				5	
2059-1	MPS-5514	2/1R	P	P	P	/				5	
2059-2	MPS-5515	2/1R	P	P	P	/				5	
2060-1	MPS-6104	3/1R	P	NA	P	/				5	
2060-2	MPS-6104A	3/1R	P	NA	P	/				5	
2060-3	MPS-6105	2/1R	P	P	P	/				5	
2060-4	MPS-6105A	1/1	NA	NA	NA	/				5	
2060-5	MPS-038X	3/1R	P	P	P	/				2	
2061-1	MPS-6102	3/1R	P	P	P	/				5	
2061-2	MPS-6102A	2/1R	P	P	P	/				5	
2062-1	MPS-6103	3/1R	P	F	P	/				5	
2062-2	MPS-039X	2/1R	P	F	P	/				2	
2063-1	MPS-5651	2/1R	P	P	P	/				5	
	MPS-5653	2/1R	P	P	P	/				5	
2063-2	MPS-5652	2/1R	P	P	P	/				5	
	MPS-5654	2/1R	P	P	P	/				5	
2064-1	MPS-829X	3/3	NA	NA	NA	/				2	
2064-2	MPS-7570	1/1	NA	NA	NA	/				5	
2065-1	MPS-830X	3/3	NA	NA	NA	/				2	
2065-2	MPS-7550	2/1R	P	P	P	/				5	
2070-1	MPS-5003	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-5004	3/3	NA	NA	NA	/				5	
2071-1	MPS-401X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2071-2	MPS-5001	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
	MPS-5002	3/1R	P	P	P	3/1R	P	F	P	1, 3, 4	X
2072-1	MPS-5043	3/1R	P	P	P	/				5	
	MPS-5052	3/1R	P	P	P	/				5	
2072-2	MPS-402X	3/1R	P	P	P	/				2	
2073-1	MPS-5044	3/1R	P	F	P	/				5	
	MPS-5053	3/1R	P	F	P	/				5	
2073-2	MPS-403X	3/1R	P	F	P	/				2	
2073-3	MPS-404X	3/1R	P	P	P	/				2	
2074-1	MPS-5041	3/1R	P	F	P	/				5	
	MPS-5051	3/1R	P	F	P	/				5	
2074-2	MPS-405X	3/1R	P	F	P	/				2	
2075-1	MPS-5042	3/1R	P	F	P	/				5	
2075-2	MPS-406X	3/1R	P	F	P	/				2	
2076-1	MPS-407X	3/1R	P	P	P	/				2	
2076-2	MPS-5034	3/1R	P	P	P	/				5	
	MPS-5063	3/1R	P	P	P	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2077-1	MPS-5035	3/1R	P	F	P	/				5	
	MPS-5064	3/1R	P	F	P	/				5	
2077-2	MPS-408X	3/1R	P	F	P	/				2	
2077-3	MPS-409X	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
2078-1	MPS-5032	3/1R	P	F	P	/				5	
	MPS-5062	3/1R	P	F	P	/				5	
2078-2	MPS-5031	3/1R	P	F	P	/				5	
	MPS-5061	3/1R	P	F	P	/				5	
2079-1	MPS-5033	3/1R	P	F	P	/				5	
2079-2	MPS-410X	3/1R	P	F	P	/				2	
2090-1	MPS-5551	2/1R	P	F	P	/				5	
	MPS-5552	2/1R	P	F	P	/				5	
2090-2	MPS-465X	3/3	NA	NA	NA	2/1R	P	F	P	1, 4	X
	MPS-466X	3/3	NA	NA	NA	2/1R	P	F	P	1, 4	X
2091-1	MPS-5553	2/1R	P	F	P	/				5	
2091-2	MPS-467X	3/3	NA	NA	NA	2/1R	P	F	P	1, 4	X
2092-1	MPS-5554	2/1R	P	F	P	2/1R	P	P	P	1, 3	X
	MPS-5555	2/1R	P	P	P	/				5	
2092-2	MPS-468X	3/3	NA	NA	NA	2/1R	P	P	P	1, 4	X
	MPS-469X	3/3	NA	NA	NA	2/1R	P	P	P	1, 4	X
2093-1	MPS-5560	2/1R	P	F	P	/				5	
2093-2	MPS-5560A	3/1R	P	F	P	/				5	
2093-3	MPS-472X	2/1R	P	F	P	2/1R	P	P	P	1, 3	X
2094-1	MPS-5559	2/1R	P	F	P	/				5	
2094-2	MPS-5559A	2/1R	P	F	P	/				5	
2094-3	MPS-470X	1/1	NA	NA	NA	/				2	
2095-1	MPS-5559B	2/1R	P	F	P	/				5	
2095-2	MPS-5559C	2/1R	P	F	P	/				5	
2095-3	MPS-471X	2/1R	P	P	P	/				2	
2096-1	MPS-5561	3/3	NA	NA	NA	2/1R	P	F	P	1, 4	X
2097-1	MPS-5550	3/3	NA	NA	NA	/				5	
2100-1	MPS-6142	3/1R	P	P	P	/				5	
2100-2	MPS-064X	3/3	NA	NA	NA	2/1R	P	P	P	1, 4	X
2100-3	MPS-065X	2/1R	P	P	P	1/1	NA	NA	NA	1, 4	X
2101-1	MPS-6142A	2/1R	P	P	P	/				5	
2101-3	MPS-067X	1/1	NA	NA	NA	3/1R	P	P	P	1, 3	X
2102-1	MPS-6144	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2102-2	MPS-066X	3/1R	P	P	P	/				2	
2103-1	MPS-6143	3/3	NA	NA	NA	/				5	
2110-1	MPS-7110	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2111-1	MPS-7130	3/1R	P	P	P	/				5	
2111-2	MPS-807X	3/1R	P	P	P	/				2	
2111-3	MPS-7130A	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2111-4	MPS-7130B	3/1R	P	P	P	/				5	
2112-2	MPS-7150	3/1R	P	P	P	/				5	
2113-1	MPS-7100A	3/1R	P	P	P	/				5	
2113-2	MPS-7100B	3/1R	P	P	P	/				5	
2114-1	MPS-7170	3/1R	P	F	P	/				5	
2114-2	MPS-808X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2115-1	MPS-7160	3/1R	P	F	P	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2115-2	MPS-7160A	3/1R	P	F	P	/				5	
2115-3	MPS-809X	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
2116-1	MPS-7110A	3/1R	P	P	P	/				5	
2117-1	MPS-7120	3/1R	P	P	P	/				5	
2117-2	MPS-810X	3/1R	P	P	P	/				2	
2117-3	MPS-7120A	3/1R	P	P	P	/				5	
2117-4	MPS-7120B	3/1R	P	P	P	/				5	
2118-1	MPS-7140	3/1R	P	P	P	/				5	
2118-2	MPS-7140A	3/1R	P	P	P	/				5	
2119-1	MPS-7170A	3/1R	P	P	P	/				5	
	MPS-7180	3/1R	P	P	P	/				5	
2119-2	MPS-811X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-812X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2120-1	MPS-813X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2121-1	MPS-7100	3/3	NA	NA	NA	/				5	
2130-1	MPS-7440	3/1R	P	NA	P	/				5	
2131-1	MPS-7430	3/1R	P	P	P	3/1R	P	NA	P	1, 3	X
2131-2	MPS-7430A	3/1R	P	P	P	3/1R	P	NA	P	1, 3	X
2131-3	MPS-820X	3/1R	P	P	P	3/1R	P	NA	P	1, 3	X
2131-4	MPS-821X	3/1R	P	P	P	3/1R	P	NA	P	1, 3	X
2132-1	MPS-7460	3/1R	P	P	P	/				5	
2132-2	MPS-822X	3/1R	P	P	P	/				2	
2133-2	MPS-823X	3/3	NA	NA	NA	/				2	
2134-1	MPS-7420	3/3	NA	NA	NA	/				5	
2134-2	MPS-7420A	3/3	NA	NA	NA	/				5	
2135-1	MPS-832X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2136-1	MPS-7420B	3/3	NA	NA	NA	/				5	
2137-1	MPS-7420C	3/3	NA	NA	NA	/				5	
2138-1	MPS-7420D	3/3	NA	NA	NA	/				5	
2139-1	MPS-7420E	3/3	NA	NA	NA	/				5	
2140-1	MPS-7210	3/1R	P	NA	P	/				5	
2141-1	MPS-7220A	3/1R	P	NA	P	/				5	
2141-2	MPS-7220B	3/1R	P	NA	P	3/3	NA	NA	NA	1, 3	X
2141-3	MPS-7220C	3/1R	P	NA	P	/				5	
	MPS-834X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2141-4	MPS-7220	3/1R	P	NA	P	3/3	NA	NA	NA	1, 3	X
2141-5	MPS-833X	3/1R	P	NA	P	/				2	
2142-1	MPS-7250	3/1R	P	P	P	3/2R	P	P	P	1, 3	X
2143-1	MPS-7240	3/1R	P	P	P	3/2R	P	P	P	1, 3	X
2143-2	MPS-835X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2144-1	MPS-7230	3/1R	P	F	P	/				5	
2144-2	MPS-7231	3/1R	P	F	P	/				5	
2144-3	MPS-836X	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
2145-1	MPS-7260	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2145-2	MPS-837X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2146-1	MPS-7260A	3/1R	P	P	P	/				5	
2146-2	MPS-838X	3/3	NA	NA	NA	/				2	
2147-1	MPS-7200	3/3	NA	NA	NA	/				5	
2147-2	MPS-7200C	3/1R	P	F	P	/				5	
2148-1	MPS-7200A	3/3	NA	NA	NA	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2148-2	MPS-7200D	3/1R	P	F	P	/				5	
2149-1	MPS-7200B	3/3	NA	NA	NA	/				5	
2150-1	MPS-7300D	3/1R	P	P	P	/				5	
2150-2	MPS-7300E	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2151-1	MPS-7300F	3/1R	P	P	P	/				5	
2151-2	MPS-7300C	3/3	NA	NA	NA	/				5	
2153-1	MPS-7300	3/3	NA	NA	NA	/				5	
2160-1	MPS-5143	2/1R	F	F	P	3/1R	P	P	P	1, 3	X
2161-1	MPS-667X	2/1R	F	F	P	3/1R	P	P	P	1, 3	X
2162-1	MPS-5142	2/1R	F	F	P	2/1R	P	P	P	1, 3	X
2162-2	MPS-5141	3/3	NA	NA	NA	1/1	NA	NA	NA	1, 4	X
	MPS-668X	3/3	NA	NA	NA	/				2	
2162-3	MPS-669X	2/1R	F	F	P	2/1R	P	P	P	1, 3	X
2163-1	MPS-670X	2/1R	F	F	P	3/1R	P	P	P	1, 3	X
2163-2	MPS-671X	3/3	NA	NA	NA	/				2	
2163-3	MPS-672X	3/3	NA	NA	NA	1/1	NA	NA	NA	1, 4	X
2163-4	MPS-673X	2/1R	F	F	P	2/1R	P	P	P	1, 3	X
2165-1	MPS-615X	2/1R	P	P	P	/				2	
2165-2	MPS-616X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2165-3	MPS-617X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2165-4	MPS-618X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2166-1	MPS-619X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2167-1	MPS-601X	2/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2167-2	MPS-602X	3/1R	P	P	P	/				2	
2167-3	MPS-603X	3/1R	F	F	P	3/3	NA	NA	NA	1, 3	X
2168-1	MPS-604X	3/3	NA	NA	NA	/				2	
2168-2	MPS-605X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2169-1	MPS-606X	3/3	NA	NA	NA	/				2	
2170-1	MPS-620X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2171-1	MPS-621X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2171-2	MPS-622X	3/1R	P	F	P	2/1R	P	P	P	1, 3, 4	X
2180-1	MPS-5071A	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
	MPS-5072	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2180-2	MPS-411X	3/3	NA	NA	NA	/				2	
2181-1	MPS-5074A	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
	MPS-5075	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2181-2	MPS-412X	3/3	NA	NA	NA	/				2	
2182-1	MPS-5000A	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
	MPS-5071	3/1R	P	F	P	/				5	
	MPS-5073	3/1R	P	F	P	/				5	
2182-2	MPS-5000	3/3	NA	NA	NA	/				5	
2183-1	MPS-5074	3/1R	P	F	P	/				5	
	MPS-5076	3/1R	P	F	P	/				5	
2183-2	MPS-413X	3/3	NA	NA	NA	/				2	
2184-1	MPS-5000B	3/1R	P	F	P	/				5	
	MPS-5074B	3/1R	P	F	P	/				5	
	MPS-5076A	3/1R	P	F	P	/				5	
2184-2	MPS-5000C	3/1R	P	F	P	/				5	
2185-1	MPS-5071B	3/3	NA	NA	NA	/				5	
	MPS-5072A	3/3	NA	NA	NA	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2185-2	MPS-414X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2186-1	MPS-5074C	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-5075A	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2186-2	MPS-415X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2187-1	MPS-5000D	3/3	NA	NA	NA	/				5	
	MPS-5071C	3/3	NA	NA	NA	/				5	
	MPS-5073A	3/3	NA	NA	NA	/				5	
2187-2	MPS-5000E	3/1R	P	F	P	/				5	
2188-1	MPS-5074E	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-5076B	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2188-2	MPS-416X	3/1R	P	F	P	/				2	
2189-1	MPS-5000F	3/3	NA	NA	NA	/				5	
	MPS-5074D	3/3	NA	NA	NA	/				5	
	MPS-5076C	3/3	NA	NA	NA	/				5	
2189-2	MPS-5000G	3/1R	P	F	P	/				5	
2191-1	MPS-5000J	3/1R	F	F	P	/				5	
2191-2	MPS-5000K	3/3	NA	NA	NA	/				5	
2192-1	MPS-5000L	3/1R	F	F	P	/				5	
2192-2	MPS-5000M	3/3	NA	NA	NA	/				5	
2193-1	MPS-5000N	3/3	NA	NA	NA	/				5	
	MPS-5000Q	3/3	NA	NA	NA	/				5	
2194-1	MPS-5000P	3/3	NA	NA	NA	/				5	
2195-1	MPS-5000Q	3/3	NA	NA	NA	/				5	
2195-2	MPS-5000R	3/1R	P	F	P	/				5	
2196-1	MPS-5000S	3/3	NA	NA	NA	/				5	
2196-2	MPS-5000T	3/1R	P	F	P	/				5	
2197-1	MPS-6152	3/3	NA	NA	NA	/				5	
2198-1	MPS-6153	3/3	NA	NA	NA	/				5	
2198-2	MPS-6153A	2/1R	P	P	P	/				5	
2198-3	MPS-6153B	1/1	NA	NA	NA	/				5	
2198-4	MPS-128X	3/1R	P	F	P	/				2	
2198-5	MPS-129X	3/1R	P	F	P	/				2	
2199-1	MPS-6154	3/1R	P	P	P	/				5	
2199-2	MPS-6154A	3/1R	P	P	P	/				5	
2200-1	MPS-6154B	3/1R	P	P	P	/				5	
	MPS-6154C	3/1R	P	P	P	/				5	
2201-1	MPS-6155	3/1R	P	P	P	/				5	
2201-2	MPS-6155A	3/1R	P	P	P	/				5	
2202-1	MPS-6025	3/1R	P	F	P	/				5	
	MPS-6156	3/1R	P	F	P	/				5	
2202-2	MPS-6156A	3/1R	P	F	P	/				5	
2203-1	MPS-6155B	3/1R	P	P	P	/				5	
2203-2	MPS-6155C	3/1R	P	P	P	/				5	
2204-1	MPS-6156B	3/1R	P	F	P	/				5	
2204-2	MPS-6156C	3/1R	P	F	P	/				5	
2205-2	MPS-130X	3/1R	P	F	P	/				2	
2205-3	MPS-131X	3/1R	P	F	P	/				2	
2206-1	MPS-6157A	3/1R	P	F	P	/				5	
2206-2	MPS-132X	3/1R	P	F	P	/				2	
2206-3	MPS-133X	2/1R	P	P	P	/				2	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2207-1	MPS-6157B	3/1R	P	F	P	/				5	
2207-2	MPS-134X	3/1R	P	F	P	/				2	
2207-3	MPS-135X	3/1R	P	P	P	/				2	
2208-1	MPS-6157C	3/1R	P	F	P	/				5	
2208-2	MPS-136X	3/1R	P	F	P	/				2	
2208-3	MPS-137X	2/1R	P	P	P	/				2	
2209-1	MPS-6158	3/1R	P	P	P	/				5	
2209-2	MPS-138X	3/3	NA	NA	NA	/				2	
2210-1	MPS-6158A	3/1R	P	P	P	/				5	
2210-2	MPS-139X	3/3	NA	NA	NA	/				2	
2211-1	MPS-6159	3/1R	P	F	P	/				5	
2211-2	MPS-140X	3/3	NA	NA	NA	/				2	
2212-1	MPS-6159A	3/1R	P	F	P	/				5	
2212-2	MPS-141X	3/3	NA	NA	NA	/				2	
2213-1	MPS-6159B	3/1R	P	F	P	/				5	
2213-2	MPS-142X	3/3	NA	NA	NA	/				2	
2214-1	MPS-6158B	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2214-2	MPS-143X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2215-1	MPS-6158C	3/3	NA	NA	NA	/				5	
2215-2	MPS-144X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2216-1	MPS-6159C	3/3	NA	NA	NA	/				5	
2216-2	MPS-145X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2217-1	MPS-6159D	3/3	NA	NA	NA	/				5	
2217-2	MPS-146X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2218-1	MPS-6159E	3/3	NA	NA	NA	/				5	
2218-2	MPS-147X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2219-1	MPS-6159F	3/3	NA	NA	NA	/				5	
2219-2	MPS-148X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2220-1	MPS-6158D	3/3	NA	NA	NA	/				5	
2220-2	MPS-149X	3/1R	P	F	P	/				2	
2221-1	MPS-6158E	3/3	NA	NA	NA	/				5	
2221-2	MPS-150X	3/1R	P	F	P	/				2	
2222-1	MPS-6151	3/3	NA	NA	NA	/				5	
	MPS-6159G	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2223-1	MPS-6151B	3/3	NA	NA	NA	/				5	
2224-1	MPS-6051A	3/3	NA	NA	NA	/				5	
2224-2	MPS-6051B	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2225-1	MPS-464X	3/3	NA	NA	NA	/				2	
2225-2	MPS-5701	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
2226-1	MPS-625X	3/3	NA	NA	NA	/				2	
2226-2	MPS-626X	3/1R	P	F	P	/				2	
2227-1	MPS-627X	3/3	NA	NA	NA	/				2	
2227-2	MPS-628X	3/1R	P	F	P	/				2	
2228-1	MPS-629X	3/3	NA	NA	NA	/				2	
2228-2	MPS-630X	3/1R	P	F	P	/				2	
2229-1	MPS-631X	3/3	NA	NA	NA	/				2	
2229-2	MPS-632X	3/1R	P	P	P	/				2	
2230-1	MPS-633X	3/3	NA	NA	NA	/				2	
2230-2	MPS-634X	2/1R	P	F	P	/				2	
2231-1	MPS-635X	3/3	NA	NA	NA	/				2	

IDENTIFIERS		NASA				IDA RECOMMENDATIONS *					
NASA FMEA NUMBER	IDA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2231-2	MPS-636X	2/1R	P	F	P	/				2	
2232-1	MPS-644X	2/1R	P	F	P	3/1R	P	P	P	1, 3	X
2232-2	MPS-645X	3/3	NA	NA	NA	/				2	
2233-1	MPS-646X	2/1R	P	F	P	3/1R	P	F	P	1, 3	X
2233-2	MPS-647X	3/1R	P	F	P	/				2	
2233-3	MPS-648X	2/1R	P	P	P	3/1R	P	P	P	1, 3	X
2234-1	MPS-649X	3/3	NA	NA	NA	/				2	
2235-1	MPS-087X	3/3	NA	NA	NA	/				2	
2235-2	MPS-088X	3/1R	P	NA	P	/				2	
2236-1	MPS-089X	3/3	NA	NA	NA	3/1R	P	P	P	1, 4	X
2236-2	MPS-090X	3/3	NA	NA	NA	/				2	
2237-1	MPS-5120B	3/3	NA	NA	NA	/				5	
	MPS-6107B	3/3	NA	NA	NA	3/1R	P	P	P	1, 4	
2237-2	MPS-5120C	3/1R	P	NA	P	3/1R	P	F	P	1, 4	X
	MPS-6107C	3/1R	P	P	P	/				5	
2238-1	MPS-5138A	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-5139A	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-6107D	3/3	NA	NA	NA	3/1R	P	P	P	1, 4	X
2238A-2	MPS-6107E	3/1R	P	P	P	/				5	
2238B-2	MPS-421X	3/1R	P	NA	P	3/1R	P	F	P	1, 4	X
	MPS-5139	3/1R	P	NA	P	3/1R	P	F	P	1, 4	X
2239-1	MPS-5138	3/1R	P	P	P	/				5	
	MPS-6107F	3/1R	P	P	P	/				5	
2239-2	MPS-422X	3/3	NA	NA	NA	/				2	
	MPS-6107G	3/3	NA	NA	NA	/				5	
2240-1	MPS-6108A	3/1R	P	F	P	/				5	
2240-3	MPS-043X	2/1R	P	F	P	/				2	
	MPS-424X	3/1R	P	F	P	/				2	
2240A-2	MPS-042X	2/1R	P	F	P	/				2	
2240B-1	MPS-5139D	3/1R	P	F	P	/				5	
2240B-2	MPS-5139E	3/1R	P	F	P	/				5	
2241-1	MPS-5139F	3/1R	P	F	P	/				5	
	MPS-6107H	3/1R	P	F	P	/				5	
2241-2	MPS-5139G	3/3	NA	NA	NA	/				5	
	MPS-6107I	3/3	NA	NA	NA	/				5	
2242-1	MPS-5766	3/1R	P	P	P	/				5	
	MPS-5767	3/1R	P	P	P	/				5	
	MPS-6013B	3/1R	P	P	P	/				5	
2242-2	MPS-5764	3/1R	P	P	P	/				5	
	MPS-5765	3/1R	P	P	P	/				5	
	MPS-6013C	3/1R	P	P	P	/				5	
2243-1	MPS-5776	3/1R	P	P	P	/				5	
	MPS-5777	3/1R	P	P	P	/				5	
	MPS-6013	3/1R	P	P	P	/				5	
2243-2	MPS-5774	3/1R	P	P	P	/				5	
	MPS-5775	3/1R	P	P	P	/				5	
	MPS-6013A	3/1R	P	P	P	/				5	
2244-1	MPS-452X	3/1R	P	F	P	/				2	
	MPS-453X	3/1R	P	F	P	/				2	
	MPS-6012C	3/1R	P	F	P	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2244-2	MPS-059X	3/1R	P	F	P	/				2	
	MPS-5761	3/1R	P	F	P	/				5	
	MPS-5763	3/1R	P	F	P	/				5	
2245-1	MPS-444X	3/1R	P	F	P	/				2	
	MPS-445X	3/1R	P	F	P	/				2	
	MPS-6012B	3/1R	P	F	P	/				5	
2245-2	MPS-049X	3/1R	P	F	P	/				2	
	MPS-5771	3/1R	P	F	P	/				5	
	MPS-5773	3/1R	P	F	P	/				5	
2246-1	MPS-443X	3/1R	P	P	P	/				2	
	MPS-6012A	3/1R	P	P	P	/				5	
2246-2	MPS-048X	3/1R	P	P	P	/				2	
	MPS-5762	3/1R	P	P	P	/				5	
2247-1	MPS-442X	3/1R	P	P	P	/				2	
	MPS-6012	3/1R	P	P	P	/				5	
2247-2	MPS-047X	3/1R	P	P	P	/				2	
	MPS-5772	3/1R	P	P	P	/				5	
2248-1	MPS-5750A	3/1R	P	F	P	/				5	
	MPS-6014B	3/1R	P	F	P	/				5	
2248-2	MPS-054X	3/1R	P	F	P	/				2	
	MPS-5750B	3/1R	P	F	P	/				5	
2248-3	MPS-055X	3/1R	P	P	P	/				2	
	MPS-5750C	3/1R	P	P	P	/				5	
2249-1	MPS-5778	3/1R	P	F	P	/				5	
	MPS-6014	3/1R	P	F	P	/				5	
2249-2	MPS-050X	3/1R	P	F	P	/				2	
	MPS-446X	3/1R	P	F	P	/				2	
2249-3	MPS-051X	3/1R	P	P	P	/				2	
	MPS-447X	3/1R	P	P	P	/				2	
2250-1	MPS-5750D	3/1R	P	F	P	/				5	
	MPS-6014C	3/1R	P	F	P	/				5	
2250-2	MPS-056X	3/1R	P	F	P	/				2	
	MPS-5750E	3/1R	P	F	P	/				5	
2250-3	MPS-057X	2/1R	P	P	P	/				2	
	MPS-5750F	2/1R	P	P	P	3/1R	P	P	P	1, 3	X
2251-1	MPS-5778A	3/1R	P	F	P	/				5	
	MPS-6014A	3/1R	P	F	P	/				5	
2251-2	MPS-052X	3/1R	P	F	P	/				2	
	MPS-448X	3/1R	P	F	P	/				2	
2251-3	MPS-053X	2/1R	P	P	P	/				2	
	MPS-449X	2/1R	P	P	P	/				2	
2252-1	MPS-5750	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-6011D	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2253-1	MPS-5750H	3/3	NA	NA	NA	/				5	
	MPS-6011	3/3	NA	NA	NA	/				5	
2254-1	MPS-058X	3/3	NA	NA	NA	/				2	
	MPS-450X	3/3	NA	NA	NA	/				2	
	MPS-5750I	3/3	NA	NA	NA	/				5	
	MPS-6011E	3/3	NA	NA	NA	/				5	
2255-1	MPS-451X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2255-1	MPS-5750J	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
	MPS-6011B	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2256-1	MPS-655X	3/1R	P	P	P	/				2	
2256-2	MPS-656X	3/3	NA	NA	NA	/				2	
2257-1	MPS-657X	3/1R	P	F	P	/				2	
2257-2	MPS-658X	3/3	NA	NA	NA	/				2	
2258-1	MPS-659X	3/3	NA	NA	NA	/				2	
2259-1	MPS-660X	3/1R	P	F	P	/				2	
2259-2	MPS-661X	3/1R	P	F	P	/				2	
2259-3	MPS-662X	3/1R	P	P	P	/				2	
2260-1	MPS-6074	2/1R	P	P	P	/				5	
2260-2	MPS-6075	3/1R	P	F	P	/				5	
2261-1	MPS-6074A	2/1R	P	P	P	/				5	
2261-2	MPS-6075A	2/1R	P	P	P	/				5	
2262-1	MPS-6074B	2/1R	P	P	P	/				5	
2262-2	MPS-6075B	2/1R	P	P	P	2/1R	P	F	P	1, 4	X
2263-1	MPS-012X	2/1R	P	P	P	/				2	
2263-2	MPS-013X	2/1R	P	F	P	2/1R	P	P	P	1, 3	X
2264-1	MPS-6071	2/1R	P	P	P	2/1R	P	F	P	1, 4	X
2265-1	MPS-6076	3/3	NA	NA	NA	/				5	
2265-2	MPS-6076A	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2266-1	MPS-6076B	3/3	NA	NA	NA	/				5	
2266-2	MPS-6076C	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2267-1	MPS-014X	2/1R	P	P	P	/				2	
2267-2	MPS-015X	2/1R	P	F	P	/				2	
2268-1	MPS-6076D	2/1R	P	P	P	/				5	
2268-2	MPS-6076E	3/1R	P	F	P	/				5	
2269-1	MPS-6076F	2/1R	P	P	P	/				5	
2269-2	MPS-6076G	2/1R	P	P	P	/				5	
2270-1	MPS-6076H	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2270-2	MPS-6076I	3/1R	P	F	P	/				5	
2271-1	MPS-6076J	3/3	NA	NA	NA	/				5	
2271-2	MPS-6076K	3/1R	P	F	P	/				5	
2272-1	MPS-016X	3/3	NA	NA	NA	3/1R	P	P	P	1, 4	X
2272-2	MPS-017X	2/1R	P	P	P	/				2	
2273-1	MPS-6076L	3/1R	P	F	P	/				5	
2273-2	MPS-6076M	3/3	NA	NA	NA	/				5	
2274-1	MPS-6076N	2/1R	P	P	P	/				5	
2274-2	MPS-6076Q	3/3	NA	NA	NA	/				5	
2275-1	MPS-018X	2/1R	P	P	P	3/1R	P	P	P	1, 3	X
2275-2	MPS-019X	3/3	NA	NA	NA	/				2	
2276-1	MPS-6076P	2/1R	P	P	P	/				5	
2276-2	MPS-6076Q	3/3	NA	NA	NA	/				5	
2277-1	MPS-6076R	2/1R	P	P	P	/				5	
2277-2	MPS-6076S	3/3	NA	NA	NA	/				5	
2278-1	MPS-020X	2/1R	P	P	P	/				2	
2278-2	MPS-021X	3/3	NA	NA	NA	/				2	
2279-1	MPS-6076T	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2280-1	MPS-5500	3/3	NA	NA	NA	/				5	
2280-2	MPS-5500A	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2281-1	MPS-5531	3/1R	P	P	P	/				5	
2281-2	MPS-434X	2/1R	P	P	P	/				2	
2282-1	MPS-5532A	3/1R	P	F	P	/				5	
2282-2	MPS-435X	3/1R	P	F	P	/				2	
2283-1	MPS-5532	3/1R	P	P	P	/				5	
2283-2	MPS-436X	2/1R	P	P	P	/				2	
2284-1	MPS-5532B	3/1R	P	F	P	/				5	
2284-2	MPS-437X	3/3	NA	NA	NA	/				2	
2285-1	MPS-5532C	2/1R	P	P	P	/				5	
2285-2	MPS-438X	3/3	NA	NA	NA	/				2	
2286-1	MPS-5533	3/3	NA	NA	NA	3/1R	P	P	P	1, 4	X
2286-2	MPS-439X	3/1R	P	P	P	3/1R	P	F	P	1, 4	
2287-1	MPS-5533A	2/1R	P	P	P	/				5	
2287-2	MPS-440X	3/3	NA	NA	NA	/				2	
2288-1	MPS-5531A	2/1R	P	P	P	3/1R	P	P	P	1, 3	X
2288-2	MPS-441X	3/3	NA	NA	NA	/				2	
2289-1	MPS-5500B	3/3	NA	NA	NA	/				5	
2290-1	MPS-5500C	3/3	NA	NA	NA	/				5	
2300-1	MPS-814X	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2301-1	MPS-815X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2301-2	MPS-816X	3/3	NA	NA	NA	3/1R	P	P	P	1, 4	X
2302-1	MPS-817X	3/3	NA	NA	NA	/				2	
2302-2	MPS-818X	3/1R	P	P	P	/				2	
2302-3	MPS-819X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2303-1	MPS-7400	3/3	NA	NA	NA	/				5	
2304-1	MPS-7400A	3/3	NA	NA	NA	/				5	
2304-2	MPS-7400B	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2305-1	MPS-7400C	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2305-2	MPS-7400D	3/3	NA	NA	NA	/				5	
2306-1	MPS-7400E	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2306-2	MPS-7400F	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2307-1	MPS-7400G	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2308-1	MPS-7400H	3/3	NA	NA	NA	/				5	
2310-1	MPS-5123	3/1R	P	NA	P	/				5	
	MPS-828X	3/3	NA	NA	NA	/				2	
2311-1	MPS-824X	3/3	NA	NA	NA	/				2	
2312-1	MPS-7530	3/3	NA	NA	NA	/				5	
2312-2	MPS-825X	1/1	NA	NA	NA	/				2	
2313-1	MPS-7510	3/3	NA	NA	NA	/				5	
2313-2	MPS-826X	2/1R	P	P	P	/				2	
2314-1	MPS-7500A	3/3	NA	NA	NA	/				5	
2314-2	MPS-7500B	2/1R	P	F	P	/				5	
2315-1	MPS-7500F	3/3	NA	NA	NA	/				5	
2316-1	MPS-7500C	3/3	NA	NA	NA	/				5	
2316-2	MPS-7500D	3/1R	P	F	P	/				5	
2317-1	MPS-7500	3/3	NA	NA	NA	/				5	
2317-2	MPS-7500E	3/3	NA	NA	NA	/				5	
2318-1	MPS-7500G	3/3	NA	NA	NA	/				5	
2319-1	MPS-7540A	3/3	NA	NA	NA	/				5	
2319-2	MPS-7540B	2/1R	P	F	P	3/1R	P	F	P	1, 3	X

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2320-1	MPS-7540F	3/3	NA	NA	NA	/				5	
2321-1	MPS-7540C	3/3	NA	NA	NA	/				5	
2321-2	MPS-7540D	3/1R	P	F	P	/				5	
2322-1	MPS-7540	3/3	NA	NA	NA	/				5	
2322-2	MPS-7540E	3/3	NA	NA	NA	/				5	
2323-1	MPS-7540G	3/3	NA	NA	NA	/				5	
2324-1	MPS-7500H	3/3	NA	NA	NA	/				5	
2325-1	MPS-7540H	3/3	NA	NA	NA	/				5	
2340-1	MPS-091X	3/1R	P	P	P	/				2	
	MPS-474X	3/1R	P	P	P	/				2	
2340-2	MPS-092X	3/1R	P	P	P	/				2	
	MPS-475X	3/1R	P	P	P	/				2	
2341-1	MPS-093X	3/1R	P	P	P	/				2	
	MPS-476X	3/1R	P	P	P	/				2	
2341-2	MPS-094X	3/1R	P	P	P	/				2	
	MPS-477X	3/1R	P	P	P	/				2	
2342-1	MPS-095X	3/1R	P	P	P	/				2	
	MPS-478X	3/1R	P	P	P	/				2	
2342-2	MPS-096X	3/1R	P	P	P	/				2	
	MPS-479X	3/1R	P	P	P	/				2	
2343-1	MPS-097X	3/1R	P	P	P	/				2	
	MPS-480X	3/1R	P	P	P	/				2	
2343-2	MPS-098X	3/1R	P	P	P	/				2	
	MPS-481X	3/1R	P	P	P	/				2	
2344-1	MPS-099X	3/1R	P	F	P	/				2	
	MPS-482X	3/1R	P	F	P	/				2	
2344-2	MPS-100X	3/1R	P	F	P	/				2	
	MPS-483X	3/1R	P	F	P	/				2	
2345-1	MPS-101X	3/1R	P	F	P	/				2	
	MPS-484X	3/1R	P	F	P	/				2	
2345-2	MPS-102X	3/1R	P	F	P	/				2	
	MPS-485X	3/1R	P	F	P	/				2	
2346-1	MPS-103X	3/1R	P	F	P	/				2	
	MPS-486X	3/1R	P	F	P	/				2	
2346-2	MPS-104X	3/1R	P	F	P	/				2	
	MPS-487X	3/1R	P	F	P	/				2	
2346-3	MPS-105X	3/1R	P	P	P	/				2	
	MPS-488X	3/1R	P	P	P	/				2	
2347-1	MPS-106X	3/1R	P	F	P	/				2	
	MPS-489X	3/1R	P	F	P	/				2	
2347-2	MPS-107X	3/1R	P	F	P	/				2	
	MPS-490X	3/1R	P	F	P	/				2	
2347-3	MPS-108X	3/1R	P	P	P	/				2	
	MPS-491X	3/1R	P	P	P	/				2	
2348-1	MPS-109X	3/1R	P	F	P	/				2	
	MPS-492X	3/1R	P	F	P	/				2	
2348-2	MPS-110X	3/1R	P	F	P	/				2	
	MPS-493X	3/1R	P	F	P	/				2	
2348-3	MPS-111X	3/1R	P	P	P	/				2	
	MPS-494X	3/1R	P	P	P	/				2	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2349-1	MPS-112X	3/1R	P	F	P	/				2	
	MPS-495X	3/1R	P	F	P	/				2	
2349-2	MPS-113X	3/1R	P	F	P	/				2	
	MPS-496X	3/1R	P	F	P	/				2	
2349-3	MPS-114X	2/1R	P	P	P	/				2	
	MPS-497X	2/1R	P	P	P	/				2	
2350-1	MPS-115X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
	MPS-498X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	
2351-1	MPS-116X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
	MPS-499X	3/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2352-1	MPS-117X	3/3	NA	NA	NA	/				2	
	MPS-500X	3/3	NA	NA	NA	/				2	
2353-1	MPS-118X	3/3	NA	NA	NA	/				2	
	MPS-501X	3/3	NA	NA	NA	/				2	
2354A-1	MPS-025X	2/1R	P	P	P	/				2	
2354A-2	MPS-026X	3/3	NA	NA	NA	/				2	
2354B-1	MPS-5171A	2/1R	P	P	P	/				5	
2354B-2	MPS-429X	3/3	NA	NA	NA	/				2	
2355A-1	MPS-027X	2/1R	P	P	P	/				2	
2355A-2	MPS-028X	2/1R	F	F	P	3/3	NA	NA	NA	1	X
2355B-1	MPS-5171	3/1R	P	P	P	/				5	
2355B-2	MPS-430X	2/1R	F	F	P	3/3	NA	NA	NA	1, 3	X
2356A-1	MPS-6086A	3/1R	P	F	P	/				5	
2356A-2	MPS-029X	3/3	NA	NA	NA	/				2	
2356B-1	MPS-5170A	3/1R	P	F	P	/				5	
2356B-2	MPS-431X	3/3	NA	NA	NA	/				2	
2357A-1	MPS-6086B	3/3	NA	NA	NA	/				5	
2357A-2	MPS-030X	3/1R	P	F	P	/				2	
2357B-1	MPS-5160	3/3	NA	NA	NA	/				5	
2357B-2	MPS-5160A	3/1R	P	P	P	/				5	
2358A-1	MPS-6086C	3/1R	P	P	P	3/1R	P	F	P	1, 4	X
2358A-2	MPS-031X	3/3	NA	NA	NA	/				2	
2358B-1	MPS-5160B	3/1R	P	P	P	/				5	
2358B-2	MPS-5160C	3/3	NA	NA	NA	/				5	
2359A-1	MPS-032X	3/3	NA	NA	NA	/				2	
	MPS-033X	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2359B-1	MPS-432X	3/3	NA	NA	NA	3/1R	P	P	P	1, 4	X
	MPS-5160D	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2360A-1	MPS-034X	3/3	NA	NA	NA	/				2	
	MPS-6087	3/3	NA	NA	NA	/				5	
2360B-1	MPS-5160E	3/3	NA	NA	NA	/				5	
2370-1	MPS-7470	3/3	NA	NA	NA	/				5	
2371-1	MPS-7470A	3/3	NA	NA	NA	/				5	
2372-1	MPS-6077	3/3	NA	NA	NA	/				5	
2372A-1	MPS-035X	3/3	NA	NA	NA	/				2	
2372B-1	MPS-5160F	3/3	NA	NA	NA	/				5	
2374-1	MPS-5500D	3/3	NA	NA	NA	/				5	
2375-1	MPS-7100C	3/3	NA	NA	NA	/				5	
2376-1	MPS-119X	3/1R	P	F	P	/				2	
	MPS-502X	3/1R	P	F	P	/				2	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2376-2	MPS-120X	3/1R	P	F	P	/				2	
	MPS-503X	3/1R	P	F	P	/				2	
2376-3	MPS-121X	3/1R	P	P	P	/				2	
	MPS-504X	3/1R	P	P	P	/				2	
2377-1	MPS-122X	3/1R	P	F	P	/				2	
	MPS-505X	3/1R	P	F	P	/				2	
2377-2	MPS-123X	3/1R	P	F	P	/				2	
	MPS-506X	3/1R	P	F	P	/				2	
2377-3	MPS-124X	3/1R	P	P	P	/				2	
	MPS-507X	3/1R	P	P	P	/				2	
2378-1	MPS-125X	3/3	NA	NA	NA	/				2	
	MPS-508X	3/3	NA	NA	NA	/				2	
2379-1	MPS-7100D	3/3	NA	NA	NA	/				5	
2379-2	MPS-7100E	3/3	NA	NA	NA	/				5	
2380-1	MPS-663X	3/3	NA	NA	NA	/				2	
2381-1	MPS-6024A	3/1R	P	F	P	/				5	
2381-2	MPS-009X	3/1R	F	F	P	/				2	
2381-3	MPS-010X	3/1R	P	F	P	3/1R	P	P	P	1, 3	X
2382-1	MPS-7580F	3/3	NA	NA	NA	/				5	
2382-2	MPS-7580G	3/3	NA	NA	NA	/				5	
2382-3	MPS-804X	3/3	NA	NA	NA	/				2	
2383-1	MPS-7580H	3/3	NA	NA	NA	/				5	
2383-2	MPS-7580I	3/3	NA	NA	NA	/				5	
2383-3	MPS-805X	3/3	NA	NA	NA	/				2	
2384-1	MPS-6051C	3/3	NA	NA	NA	/				5	
2385-1	MPS-5700	3/3	NA	NA	NA	/				5	
2386-1	MPS-5550A	3/3	NA	NA	NA	/				5	
2387-1	MPS-473X	3/3	NA	NA	NA	/				2	
	MPS-5550B	3/3	NA	NA	NA	/				5	
2389-1	MPS-5000U	3/3	NA	NA	NA	/				5	
2390-1	MPS-5000V	3/3	NA	NA	NA	/				5	
2390-2	MPS-5000W	3/1R	F	F	P	/				5	
2391-1	MPS-5000Y	3/3	NA	NA	NA	/				5	
2391-2	MPS-5000Z	3/1R	F	F	P	/				5	
2392-1	MPS-6157D	3/1R	P	F	P	/				5	
2392-2	MPS-151X	3/1R	P	F	P	/				2	
2392-3	MPS-152X	3/1R	P	P	P	/				2	
2393-1	MPS-6157E	3/1R	P	F	P	/				5	
2393-2	MPS-153X	3/1R	P	F	P	/				2	
2393-3	MPS-154X	3/1R	P	P	P	/				2	
2394-1	MPS-6151C	3/3	NA	NA	NA	/				5	
2395-1	MPS-650X	3/3	NA	NA	NA	/				2	
2396-1	MPS-676X	3/3	NA	NA	NA	/				2	
2397-1	MPS-5138B	3/1R	P	F	P	/				5	
	MPS-6108B	3/1R	P	F	P	/				5	
2397-2	MPS-044X	3/1R	F	F	P	3/1R	P	F	P	1, 3	X
	MPS-425X	3/1R	F	F	P	/				2	
2397-3	MPS-045X	3/1R	P	P	P	/				2	
	MPS-426X	3/1R	P	P	P	/				2	
2398-1	MPS-5779	3/1R	P	F	P	/				5	

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	ISSUE
2398-1	MPS-6014D	3/1R	P	F	P	/				5	
2398-2	MPS-060X	3/1R	P	F	P	/				2	
	MPS-454X	3/1R	P	F	P	/				2	
2398-3	MPS-061X	3/1R	P	P	P	/				2	
	MPS-455X	3/1R	P	P	P	/				2	
2399-1	MPS-5750K	3/1R	P	F	P	/				5	
	MPS-6014E	3/1R	P	F	P	/				5	
2399-2	MPS-062X	3/1R	P	F	P	/				2	
	MPS-5750L	3/1R	P	F	P	/				5	
2399-3	MPS-063X	3/1R	P	P	P	/				2	
	MPS-5750M	3/1R	P	P	P	/				5	
2400-1	MPS-5750N	3/3	NA	NA	NA	/				5	
	MPS-6011F	3/3	NA	NA	NA	/				5	
2401-1	MPS-7500I	3/3	NA	NA	NA	/				5	
2402-1	MPS-7540I	3/3	NA	NA	NA	/				5	
2403-1	MPS-7300A	3/3	NA	NA	NA	/				5	
2404-1	MPS-7300B	3/3	NA	NA	NA	/				5	
2404-2	MPS-7300G	3/3	NA	NA	NA	3/1R	P	F	P	1, 4	X
2405-1	MPS-6131A	3/3	NA	NA	NA	/				5	
2406-1	MPS-6131B	3/3	NA	NA	NA	/				5	
2407-1	MPS-681X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2408-1	MPS-682X	2/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2409-1	MPS-683X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2410-1	MPS-684X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2411-1	MPS-5600	3/3	NA	NA	NA	/				5	
2411-2	MPS-5600A	2/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2412-1	MPS-5600B	2/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2413-1	MPS-5600C	2/1R	P	P	P	3/3	NA	NA	NA	1, 3	X
2414-1	MPS-7100F	3/3	NA	NA	NA	/				5	
	MPS-7400I	3/3	NA	NA	NA	/				5	
2416-1	MPS-680X	3/1R	P	F	P	3/3	NA	NA	NA	1, 3	X
2416-2	MPS-5600D	3/3	NA	NA	NA	/				5	
N/A	MPS-046X	/				3/3	NA	NA	NA	1, 2	X
	MPS-1014	/				1/1	NA	NA	NA	1, 2	X
	MPS-6027	/				3/1R	P	F	P	1, 4	X
	MPS-7190	/				3/1R	P	P	P	1, 3, 4	X
	MPS-827X	/				3/3	NA	NA	NA	1, 2	X
	MPS-831X	/				3/3	NA	NA	NA	1, 2	X
NA	MPS-023X	/				3/3	NA	NA	NA	1	X
	MPS-036X	/				3/3	NA	NA	NA	1, 2	X
	MPS-037X	/				2/1R	P	P	P	1, 2	X
	MPS-068X	/				3/3	NA	NA	NA	1, 2	X
	MPS-1001	/				/				6	
	MPS-1006	/				1/1	NA	NA	NA	1, 2	X
	MPS-1013	/				/				6	
	MPS-1027	/				/				6	
	MPS-1054	/				/				6	
	MPS-1055	/				1/1	NA	NA	NA	1, 2	X
	MPS-1071	/				/				6	
	MPS-1093	/				1/1	NA	NA	NA	1, 4	X

IDENTIFIERS		NASA			IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A B C	CRIT HW/F	SCREENS A B C	OTHER (SEE LEGEND CODE)	ISSUE
NA	MPS-1094	/		/		6	
	MPS-1101	/		3/3	NA NA NA	1, 2	X
	MPS-1156	/		/		6	
	MPS-1176	/		/		6	
	MPS-1211	/		/		6	
	MPS-1221	/		/		6	
	MPS-1231	/		/		6	
	MPS-1241	/		3/3	NA NA NA	1, 3	X
	MPS-1251	/		3/3	NA NA NA	1, 2	X
	MPS-1261	/		3/3	NA NA NA	1, 3	X
	MPS-1271	/		3/3	NA NA NA	1, 3	X
	MPS-1292	/		3/3	NA NA NA	6	
	MPS-2022	/		3/3	NA NA NA	1, 2	X
	MPS-2082	/		3/3	NA NA NA	1, 2	X
	MPS-2083	/		3/3	NA NA NA	1, 3	X
	MPS-2113	/		3/3	NA NA NA	1, 2	X
	MPS-2122	/		3/3	NA NA NA	1, 2	X
	MPS-2133	/		3/3	NA NA NA	1, 2	X
	MPS-2142	/		3/3	NA NA NA	1, 2	X
	MPS-2152	/		3/3	NA NA NA	1, 2	X
	MPS-2164	/		3/3	NA NA NA	1, 2	X
	MPS-2171	/		3/3	NA NA NA	1, 2	X
	MPS-2172	/		3/3	NA NA NA	1, 2	X
	MPS-2174	/		3/3	NA NA NA	1, 2	X
	MPS-2175	/		3/3	NA NA NA	1, 2	X
	MPS-2176	/		3/3	NA NA NA	1, 2	X
	MPS-2241	/		/		6	
	MPS-2251	/		/		6	
	MPS-2281	/		/		6	
	MPS-2292	/		3/3	NA NA NA	1, 3	X
	MPS-2302	/		3/3	NA NA NA	1, 3	X
	MPS-2312	/		3/3	NA NA NA	1, 3	X
	MPS-2331	/		/		6	
	MPS-3030	/		/		6	
	MPS-304X	/		3/3	NA NA NA	1, 2	X
	MPS-305X	/		1/1	NA NA NA	1, 2	X
	MPS-3060	/		/		6	
	MPS-3082	/		2/2	NA NA NA	1, 2	X
	MPS-311X	1/1	NA NA NA	/		2	
	MPS-3130	/		1/1	NA NA NA	1, 4	X
	MPS-3200	/		/		6	
	MPS-4060	/		3/3	NA NA NA	1, 2	X
	MPS-4090	/		/		6	
	MPS-4091	/		/		6	
	MPS-4100	/		/		6	
	MPS-4101	/		/		6	
	MPS-4110	/		3/3	NA NA NA	1, 2	X
	MPS-4141	/		3/1R	P F P	1, 4	X
	MPS-4191	/		1/1	NA NA NA	1, 4	X
	MPS-4271	/		3/3	NA NA NA	1, 2	X

IDENTIFIERS		NASA			IOA RECOMMENDATIONS *				
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B C	CRIT HW/F	SCREENS A	B C	OTHER (SEE LEGEND CODE)	ISSUE
NA	MPS-4361	/			/			1, 3, 4	X
	MPS-4420	/			/			6	
	MPS-4421	/			/			6	
	MPS-4422	/			/			6	
	MPS-4430	/			/			6	
	MPS-4431	/			/			6	
	MPS-4432	/			/			6	
	MPS-4460	/			/			6	
	MPS-4470	/			/			6	
	MPS-4480	/			/			6	
	MPS-4490	/			/			6	
	MPS-4500	/			/			6	
	MPS-4510	/			/			6	
	MPS-4520	/			/			6	
	MPS-4620	/			1/1	NA	NA NA	1, 4	X
	MPS-4630	/			/			6	
	MPS-4640	/			/			6	
	MPS-4650	/			1/1	NA	NA NA	1, 2	X
	MPS-4666	/			/			6	
	MPS-5000AA	/			/			6	
	MPS-5011	/			2/1R	P	P P	1, 2	X
	MPS-5012	/			2/1R	P	P P	1, 2	X
	MPS-5013	/			2/1R	P	P P	1, 2	X
	MPS-5014	/			2/1R	P	P P	1, 2	X
	MPS-5015	/			3/1R	P	P P	1, 2	X
	MPS-5016	/			3/1R	P	P P	1, 2	X
	MPS-5017	/			3/1R	P	P P	1, 2	X
	MPS-5018	/			3/1R	P	P P	1, 2	X
	MPS-5019	/			3/1R	P	P P	1, 2	X
	MPS-5020	/			3/1R	P	P P	1, 2	X
	MPS-5021	/			3/1R	P	P P	1, 2	X
	MPS-5022	/			3/1R	P	P P	1, 2	X
	MPS-5120G	/			/			6	
	MPS-5121	/			3/1R	P	NA P	1, 3	X
	MPS-5132	/			3/1R	P	F P	1, 3	X
	MPS-5133	/			3/1R	P	F P	1, 4	X
	MPS-5134	/			3/1R	P	F P	1, 3	X
	MPS-5135	/			3/1R	P	F P	1, 4	X
	MPS-5136	/			3/1R	P	F P	1, 3	X
	MPS-5137	/			3/1R	P	F P	1, 4	X
	MPS-5172	/			3/1R	P	P P	1, 4	X
	MPS-5173	/			3/1R	P	P P	1, 2	X
	MPS-5174	/			3/1R	P	P P	1, 2	X
	MPS-5175	/			/			6	
	MPS-5176	/			/			6	
	MPS-5521	/			3/1R	P	P P	1, 2	X
	MPS-5522	/			3/1R	P	P P	1, 2	X
	MPS-5523	/			3/1R	P	P P	1, 2	X
	MPS-5524	/			3/1R	P	P P	1, 2	X
	MPS-5525	/			3/1R	P	P P	1, 2	X

IDENTIFIERS		NASA				IOA RECOMMENDATIONS *					ISSUE
NASA FMEA NUMBER	IOA ASSESSMENT NUMBER	CRIT HW/F	SCREENS A	B	C	CRIT HW/F	SCREENS A	B	C	OTHER (SEE LEGEND CODE)	
NA	MPS-5526	/				3/1R	P	P	P	1, 2	X
	MPS-5556	/				2/1R	P	F	P	1, 4	X
	MPS-5557	/				2/1R	P	F	P	1, 4	X
	MPS-5558	/				2/1R	P	F	P	1, 4	X
	MPS-5561A	/				3/3	NA	NA	NA	1, 3	X
	MPS-5700B	/				3/3	NA	NA	NA	1, 2	X
	MPS-5702	/				3/1R	P	P	P	1, 2	X
	MPS-5703	/				3/1R	P	P	P	1, 2	X
	MPS-5704	/				3/1R	P	P	P	1, 2	X
	MPS-5705	/				3/1R	P	P	P	1, 2	X
	MPS-5750G	/				3/3	NA	NA	NA	1, 2	X
	MPS-5750D	/				3/3	NA	NA	NA	1, 2	X
	MPS-5750P	/				3/3	NA	NA	NA	1, 2	X
	MPS-5751	/				3/1R	P	P	P	1, 4	X
	MPS-5752	/				3/1R	P	P	P	1, 4	X
	MPS-5753	/				3/1R	P	P	P	1, 4	X
	MPS-5754	/				3/1R	P	P	P	1, 4	X
	MPS-5755	/				3/1R	P	P	P	1, 4	X
	MPS-5756	/				3/1R	P	P	P	1, 4	X
	MPS-6011A	/				3/3	NA	NA	NA	1, 2	X
	MPS-6011C	/				3/3	NA	NA	NA	1, 2	X
	MPS-6015	/				3/1R	P	P	P	1, 3	X
	MPS-6016	/				2/1R	P	F	P	1, 3	X
	MPS-6021A	/				3/3	NA	NA	NA	1, 2	X
	MPS-6021B	/				3/3	NA	NA	NA	1, 2	X
	MPS-6026	/				3/1R	P	F	P	1, 2	X
	MPS-6051D	/				3/3	NA	NA	NA	1, 2	X
	MPS-6051E	/				3/3	NA	NA	NA	1, 2	X
	MPS-6061	/				3/3	NA	NA	NA	1, 2	X
	MPS-6078	/				3/1R	P	F	P	1, 2	X
	MPS-6079	/				3/3	NA	NA	NA	1, 2	X
	MPS-6088	/				3/1R	P	F	P	1, 2	X
	MPS-6089	/				3/3	NA	NA	NA	1, 2	X
	MPS-6101D	/				3/3	NA	NA	NA	1, 2	X
	MPS-6109	/				3/1R	P	F	P	1, 2	X
	MPS-6141	/				2/1R	P	P	P	1, 3	X
	MPS-6144A	/				3/3	NA	NA	NA	1, 2	X
	MPS-6145	/				3/3	NA	NA	NA	1, 2	X
	MPS-6151A	/				3/3	NA	NA	NA	1, 2	X
	MPS-6160	/				3/1R	P	F	P	1, 2	X
	MPS-7191	/				3/3	NA	NA	NA	1, 2	X
	MPS-7271	/				3/3	NA	NA	NA	1, 2	X
	MPS-7490	/				2/1R	P	P	P	1, 4	X
	MPS-7520	/				3/1R	P	P	P	1, 2	X
	MPS-7560	/				3/1R	P	P	P	1, 2	X
	MPS-7610	/				3/1R	P	P	P	1, 2	X
XXXXXX	MPS-350X	1/1	NA	NA	NA	/				2	