INDEPENDENT ORBITER ASSESSMENT

ASSESSMENT
OF THE
LIFE SUPPORT &
AIRLOCK SUPPORT
SYSTEMS
VOLUME 2 OF 2

26 FEBRUARY 1988
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2239X
NASA FMEA #: 06-2-0115-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2239
ITEM: ODOR/BACTERIA FILTER (2)
LEAD ANALYST: K. BARICKMAN

ASSESSMENT:

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IOA [ 3 /2R ] [ P ] [ NA ] [ P ] [ ]

COMPARE [ / ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ NA ] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

IOA/NASA FM: RESTRICTED/BLOCKED FLOW

REPORT DATE 03/10/88 C-501
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2240X
NASA FMEA #: 06-2-0221-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2240
ITEM: BALLAST VALVE SCREEN (1)

LEAD ANALYST: K. BARICKMAN

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(REM) (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

IOA FM: DAMAGED ELEMENT/OPEN
NASA FM: DAMAGED ELEMENT

REPORT DATE 03/10/88  C-502
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2241X
NASA FMEA #: 06-2-0119-4

ASSESSMENT WORKSHEET

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2241
ITEM: BALLAST SELECT VALVE (BALLAST VALVE ASSEMBLY)

LEAD ANALYST: K. BARICKMAN

CRITICALITY
FLIGHT
HDW/FUNC

REduNDANCY SCREENS
A   B   C

NASA  [3/3]   [ ]   [ ]   [ ]   [ ]   [ ]   [ ]* 

IOA  [3/3]   [ ]   [ ]   [ ]   [ ]   [ ]

COMPARE  [ / ]   [ ]   [ ]   [ ]   [ ]   [ ]

RECOMMENDATIONS: (If different from NASA)
[3/3]   [ ]   [ ]   [ ]   [ ]   [ ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: EXTERNAL LEAKAGE

REPORT DATE 03/10/88 C-503
**APPENDIX C**  
**ASSESSMENT WORKSHEET**

*ASSESSMENT DATE: 12/22/87  NASA DATA: BASELINE [ ]*  
*ASSESSMENT ID: LS-2242X  NEW [ X ]*  
*NASA FMEA #: 06-2-0446-1*  

**SUBSYSTEM:** LIFE SUPPORT  
**MDAC ID:** 2242  
**ITEM:** BALLAST VALVE TO BALLAST CONTROL VALVE LINES AND FITTINGS (1)  

**LEAD ANALYST:** K. BARICKMAN  

**ASSESSMENT:**

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**RECOMMENDATIONS:** (If different from NASA)

[3/2R] [P] [NA] [P] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]  
INADEQUATE [ ]

**REMARKS:**

IOA FM: RESTRICTED/BLOCKED FLOW  
NASA FM: RESTRICTED FLOW, EXTERNAL LEAKAGE  


**REPORT DATE 03/10/88  C-504**
**APPENDIX C
ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 12/22/87  
**NASA DATA:**  
**ASSESSMENT ID:** LS-2243X  
**NASA FMEA #:** 06-2-0446-1  
**BASELINE** [ ]  
**NEW** [ x ]

**SUBSYSTEM:** LIFE SUPPORT  
**MDAC ID:** 2243  
**ITEM:** BALLAST VALVE TO BALLAST CONTROL VALVE LINES AND FITTINGS (1)

**LEAD ANALYST:** K. BARICKMAN

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- IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

**COMPARE** [ / ] [ ] [ ] [ ] [ ] [ ] [ ]

**RECOMMENDATIONS:** (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

**CIL RETENTION RATIONALE:** (If applicable)

- ADEQUATE [ ]
- INADEQUATE [ ]

**REMARKS:**

- IOA FM: EXTERNAL LEAKAGE
- NASA FM: RESTRICTED FLOW / EXTERNAL LEAKAGE

**REPORT DATE 03/10/88**  
**C-505**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2244X
NASA FMEA #: 06-2-0502-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2244
ITEM: THIGH BAR RERAINT (2)

LEAD ANALYST: K. BARICKMAN

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

IOA/NASA FM: FAILS IN "IN-USE" POSITION

REPORT DATE 03/10/88 C-506
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2245X
NASA FMEA #: 06-2-0505-3
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2245
ITEM: WCS BYPASS SWITCH (2)
LEAD ANALYST: K. BARICKMAN

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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: SHORTED TO GROUND

REPORT DATE 03/10/88 C-507
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2246X
NASA FMEA #: 06-2-0436-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2246
ITEM: WASTE TANK INLET LINES AND FITTINGS (1)

LEAD ANALYST: K. BARICKMAN

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RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ NA ] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: RESTRICTED FLOW
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2247X
NASA FMEA #: 06-2-0437-1

NASA DATA: BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2247
ITEM: WASTE TANK OUTLET LINES AND FITTINGS

LEAD ANALYST: K. BARICKMAN

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: RESTRICTED/BLOCKED FLOW

REPORT DATE 03/10/88 C-509
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2248X
NASA FMEA #: 06-2-0314-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2248
ITEM: HYDROPHOBIC FILTER (1)
LEAD ANALYST: K. BARICKMAN

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: RESTRICTED/BLOCKED FLOW

REPORT DATE 03/10/88 C-510
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2249X
NASA FMEA #: 06-2-0431-2

ASSESSMENT ID: LS-2249X  NASA DATA:
BASELINE [ ]  NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2249
ITEM: CONTINGENCY CROSS-TIE QD AND PLUG (1)

LEAD ANALYST: K. BARICKMAN

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: INTERNAL LEAKAGE

REPORT DATE 03/10/88  C-511
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2250X
NASA FMEA #: 06-2-0431-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2250
ITEM: CONTINGENCY CROSS-TIE QD AND PLUG (1)

LEAD ANALYST: K. BARICKMAN

NASA DATA:
BASELINE [ ]
NEW [ X ]

NASA FMEA #: 06-2-0431-1

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: EXTERNAL LEAKAGE

REPORT DATE 03/10/88 C-512
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87  
ASSESSMENT ID: LS-2251X  
NASA FMEA #: 05-6VC-2037-1  
SUBSYSTEM: LIFE SUPPORT  
MDAC ID: 2251  
ITEM: WASTE DUMP VALVE SWITCH INDICATOR (1)  
LEAD ANALYST: K. BARICKMAN

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

IOA/NASA FM: FAILS OPEN

REPORT DATE 03/10/88  C-513
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2252X
NASA FMEA #: 05-6VC-2037-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2252
ITEM: WASTE DUMP VALVE SWITCH

LEAD ANALYST: K. BARICKMAN

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: SHORTED TO GROUND

IOA COMMENT: THE FIRST FAILURE IS POTENTIAL PROBLEM IF VALVE OPEN AT FAILURE BECAUSE OF LOST CONTINGENCY DUMP CAPABILITY. POTENTIAL LOSS OF LIFE IF DUMP ISOLATION VALVE FAILS TO CLOSE IF DUMP VALVE IS OPEN AT FAILURE, THUS CRITICALITY 2/1R PNP.

THE DISAGREEMENT IN THE REDUNDANCY SCREENS WAS DUE TO NO DETAILED DISCUSSION WITH THE NASA SUBSYSTEM MANAGERS REGARDING THE REDUNDANT PATHS.

REPORT DATE 03/10/88 C-514
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2253X
NASA FMEA #: 06-2-0215-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2253
ITEM: FAN/SEPARATOR INLET HOSE FROM COMMODE (2)

LEAD ANALYST: K. BARICKMAN

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ NA] [ P ] [ ]

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

IOA FM: RESTRICTED/BLOCKED FLOW
NASA FM: RESTRICTED FLOW, EXTERNAL LEAKAGE

REPORT DATE 03/10/88 C-515
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2254X
NASA FMEA #: 06-2-0221-1

NASA DATA:
BASELINE [   ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2254
ITEM: SCREEN, DOWNSTREAM OF BALLAST/REPRESS SCREEN (1)

LEAD ANALYST: K. BARICKMAN

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

IOA/NASA FM: RESTRICTED FLOW

IOA COMMENT: THE DISAGREEMENT IN THE REDUNDANCY SCREENS WAS DUE TO NO DETAILED DISCUSSION WITH THE NASA SUBSYSTEM MANAGERS REGARDING THE REDUNDANT PATHS.

REPORT DATE 03/10/88 C-516
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2255X
NASA FMEA #: 06-2-0439-2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2255
ITEM: LINES AND FITTINGS, DUMP VALVE TO NOZZLE (1)

LEAD ANALYST: K. BARICKMAN

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

| [ 3 /2R ] | [ P ] | [ NA] | [ P ] | [ ] |

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

IOA/NASA FM: EXTERNAL LEAKAGE
IOA COMMENT: NO LOSS OF LIFE/VEHICLE SITUATION, HOWEVER COULD BE LOSS OF MISSION DUE TO CONTAMINATION OF PAYLOADS.

THE EFFECTS OF WASTE WATER BEING DUMPED INTO THE CARGO BAY WAS CONSIDERED TO BE A LOSS OF MISSION FOR THE IOA ANALYSIS, NOT THE LOSS OF LIFE DESCRIBED BY THE NASA FMEA.

REPORT DATE 03/10/88 C-517
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/22/87
ASSESSMENT ID: LS-2256X
NASA FMEA #: 06-2-0439-1

NASA DATA: BASELINE [ ] NEW [ x ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2256
ITEM: LINES AND FITTINGS, DUMP VALVE TO NOZZLE (1)

LEAD ANALYST: K. BARICKMAN

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ NA] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: RESTRICTED/BLOCKED FLOW

IOA COMMENT: THE RESTRICTED EXTERNAL DUMP LINE IS NOT A LIFE/VEHICLE LOSS SITUATION, BUT COULD BE A LOSS OF MISSION IF MISSION DURATION EXCEEDS FCB/UCD SUPPLIES OR THE SUPPLY WATER DUMP LINE IS LOST.

THE EFFECTS OF WASTE WATER BEING DUMPED INTO THE CARGO BAY WAS CONSIDERED TO BE A LOSS OF MISSION FOR THE IOA ANALYSIS, NOT THE LOSS OF LIFE DESCRIBED BY THE NASA FMEA.

REPORT DATE 03/10/88 C-518
C.3

SMOKE DETECTION/FIRE SUPPRESSION SUBSYSTEM

ASSESSMENT WORKSHEETS
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: LS-3001
NASA FMEA #: 05-6V-2000-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3001
ITEM: CB-SMOKE DETN BAY 2A/3B, 1B/3A, 1A/2B (CB8, 7, 7)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
[ 2 /1R ] [ P ] [ F ] [ P ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
PER NSTS-222006 (CN 4) PARAGRAPH 2.3.5A SCREEN B FAILS BECAUSE THE SENSORS ARE OPERATING DURING LOS. VISUAL OPEN STATE OF CIRCUIT BREAKERS IS NOT CONSIDERED DETECTABLE. A POSSIBLE ADDITION TO THE SMOKE CONCENTRATION OUTPUT WOULD BE TO TRIGGER FDA IF THE OUTPUT FAILS TO ZERO, INDICATING LOSS OF POWER TO THE SENSOR.

REPORT DATE 03/10/88 C-520
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: LS-3002
NASA FMEA #: 05-6V-2000-2

NASA DATA:
BASELINE [ ]
NEW [ x ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3002
ITEM: CB-SMOKE DETN BAY 2A/3B, 1B/3A, 1A/2B (CB8, 7, 7)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-521
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: LS-3003
NASA FMEA #: 05-6V-2000-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3003
ITEM: CB-SMOKE DETN L/R FLT DECK (CB7)
LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)

[ 2 /1R ] [ P ] [ F ] [ P ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
PER NSTS-22206 (CN 4) PARAGRAPH 2.3.5A SCREEN B FAILS BECAUSE THE SENSORS ARE OPERATING DURING LOS. VISUAL OPEN STATE OF CIRCUIT BREAKERS IS NOT CONSIDERED DETECTABLE. A POSSIBLE ADDITION TO THE SMOKE CONCENTRATION OUTPUT WOULD BE TO TRIGGER FDA IF THE OUTPUT FAILS TO ZERO, INDICATING LOSS OF POWER TO SENSOR.
### APPENDIX C
#### ASSESSMENT WORKSHEET

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#### RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

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#### REMARKS:

REPORT DATE 03/10/88 C-523
## APPENDIX C
### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 1/05/88  
**ASSESSMENT ID:** LS-3005  
**NASA FMEA #:** 05-6V-2000-1  
**NASA DATA:**  
- BASELINE [ ]  
- NEW [ X ]  

**SUBSYSTEM:** LIFE SUPPORT  
**MDAC ID:** 3005  
**ITEM:** CB-SMOKE DETN CABIN (CB6)  
**LEAD ANALYST:** J.D. ARBET  

### ASSESSMENT:

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**RECOMMENDATIONS:**  
(If different from NASA)  

[ 2 /1R ]  
[ P ]  
[ F ]  
[ P ]  

(ADD/DELETE)

* CIL RETENTION RATIONALE:  
(If applicable)  
- ADEQUATE [ ]  
- INADEQUATE [ ]

**REMARKS:**  
PER NSTS-22206 (CN 4) PARAGRAPH 2.3.5A SCREEN B FAILS BECAUSE THE SENSORS ARE OPERATING DURING LOS. VISUAL OPEN STATE OF CIRCUIT BREAKERS IS NOT CONSIDERED DETECTABLE. A POSSIBLE ADDITION TO THE SMOKE CONCENTRATION OUTPUT WOULD BE TO TRIGGER FDA IF THE OUTPUT FAILS TO ZERO, INDICATING LOSS OF POWER TO THE SENSOR.

**REPORT DATE:** 03/10/88  
**C-524**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: LS-3006
NASA FMEA #: 05-6V-2000-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3006
ITEM: CB-SMOKE DETN CABIN (CB6)
LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)
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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-525
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: LS-3007
NASA FMEA #: 05-6V-2001-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3007
ITEM: CB-FIRE SUPPR, BAY 1, 2, 3 (CB8, 8, 9)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-526
**APPENDIX C**

**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 1/05/88  
**ASSESSMENT ID:** LS-3008  
**NASA FMEA #:** 05-6V-2001-3

**SUBSYSTEM:** LIFE SUPPORT  
**MDAC ID:** 3008  
**ITEM:** CB-FIRE SUPPR BAY 1, 2, 3 (CB8, 8, 9)

**LEAD ANALYST:** J.D. ARBET

**ASSESSMENT:**

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**RECOMMENDATIONS:**  
(If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

**REMARKS:**

**REPORT DATE** 03/10/88  
C-527
APPENDIX C

ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: LS-3009
NASA FMEA #: 05-6V-2078-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3009
ITEM: RESISTOR-A2R1, A2R2, A2R3 (5.1K)

LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
The IOA & NASA CRITICALITIES MATCH AS ASSESSED VIA NSTA 22206, BUT THE CIRCUIT DESIGN ALLOWS FOR CONCERN BASED UPON THE SCENARIO OF A FAILED OPEN RESISTOR AND BOTTLE LEAK CAN RESULT IN AN EMPTY BOTTLE THAT CANNOT BE DETECTED. THESE COMBINED FAILURES SHOULD BE NOTED VIA GROUND TEST, BUT AFTER AV BAY CLOSE OUT AND ON-ORBIT THE CREW AND FLIGHT CONTROLLERS HAVE NO INSIGHT TO THE TOTAL PROBLEM. THIS LEADS ONE TO CONSIDER THE CRITICALITY AS A 1R/2.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: LS-3010
NASA FMEA #: N/A
NASA DATA: BASELINE [ ] NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3010
ITEM: RESISTOR-A2R1, A2R2, A2R3 (5.1K)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ ] / [ ] [ ] [ ] [ ] [ ]

*(ADD/DELETE)*

*CIL RETENTION RATIONALE: (If applicable)*

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SHORTS (TO GROUND OR END-TO-END) ARE NOT CONSIDERED A CREDIBLE FAILURE FOR THIS TYPE RESISTOR.

REPORT DATE 03/10/88 C-529
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3011
NASA FMEA #: 05-6V-2027-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3011
ITEM: SW-SMOKE DETECTION SENSOR RESET (S7)
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-530
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3012
NASA FMEA #: 05-06-2027-3

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3012
ITEM: SW-SMOKE DETECTION SENSOR RESET (S7)
LEAD ANALYST: J.D. ARBET

NASA DATA:
BASELINE [ ]
NEW [ X ]

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE SMOKE STATUS INDICATIONS ARE LOST FOR THE SENSORS ASSOCIATE WITH THE CLOSED CONTACTS (CONTINUOUS RESET ISSUED). POSSIBLE LOSS OF CREW/VEHICLE WITH LOSS OF ALL LIKE AND UNLIKE REDUNDANCY (ALL ALARM OUTPUTS).

REPORT DATE 03/10/88 C-531
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3013
NASA FMEA #: 05-6V-2029-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3013
ITEM: SW-SMOKE DETECTION CIRCUIT TEST (S8)
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

CRITICALITY
FLIGHT
HDW/FUNC
NASA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ] * [ ]
IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]
COMPARE [ / ] [ ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)
[ / ] [ ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
The IOA & NASA CRITICALITIES MATCH AS ASSESSED VIA NSTS 22206,
but the circuit design allows for concern based upon the scenario
of the switch shorted to ground so that the change in suppressant
container pressure can not be annunciated and the
container leaks between the ground closeout and the next systems
test. See assessment LS-3015 for further deliniation.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3013A
NASA FMEA #: 05-6V-2029-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3013
ITEM: SW-SMOKE DETECTION CIRCUIT TEST (S8)
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

CRITICALITY
FLIGHT

HDW/FUNC
NASA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ] [ ]
IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]
COMPARE [ / ] [ ] [ ] [ ] [ ] [ ]

REDUNDANCY SCREENS

A

B

C

ITEM

CIL

[ / ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-533
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3014
NASA FMEA #: 05-6V-2029-3
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3014
ITEM: SW-SMOKE DETECTION CIRCUIT TEST (S8)
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

CRITICALITY REDUNDANCY SCREENS CIL
FLIGHT HDW/FUNC A B C ITEM

| NASA | [ 3 /1R ] | [ P ] | [ P ] | [ P ] | [ ] * |
| IOA  | [ 2 /2 ] | [ ] | [ ] | [ ] | [ X ] |
| COMPARE | [ N /N ] | [ N ] | [ N ] | [ N ] | [ N ] |

RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE SMOKE STATUS INDICATIONS ARE LOST FOR THE SENSORS ASSOCIATED WITH THE CLOSED CONTACTS (SENSOR CONTINUOUSLY IN TEST). POSSIBLE LOSS OF CREW/VEHICLE WITH LOSS OF ALL LIKE AND UNLIKE REDUNDANCY (SENSOR SMOKE CONCENTRATION OUTPUT AND REDUNDANT SENSOR).

REPORT DATE 03/10/88 C-534
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88  NASA DATA:
ASSESSMENT ID: LS-3015  BASELINE [ ]
NASA FMEA #: 06-2-330003-2  NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3015
ITEM: FIRE SUPPRESSANT PRESSURE SENSOR

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE IOA & NASA CRITICALITIES MATCH AS ASSESSED VIA NSTS 22206, BUT THE CIRCUIT DESIGN ALLOWS FOR CONCERN BASED UPON THE SCENERIO OF THE PRESSURE SWITCH FAILED SUCH THAT THE GROUND CANNOT BE REMOVEd AND THEREFORE NO CHANGE IN PRESSURE INDICATED, AND A BOTTLE LEAK THAT CAN RESULT IN AN EMPTY BOTTLE THAT CANNOT BE DETECTED. THESE COMBINED FAILURES SHOULD BE DETECTED VIA GROUND TEST, BUT AFTER AV BAY CLOSEOUT AND ON-ORBIT CREW & FLIGHT CONTROLLERS HAVE NO INSIGHT TO THE TOTAL PROBLEM THE ONLY WAY THE SCENERIO IS DETECTED IS IF THE SUPPRESSENT IS REQUIRE TO PUT OUT A FIRE AND NO EFFECT IS GAINED BY ACTIVATING THE BOTTLE.

REPORT DATE 03/10/88 C-535
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88  
ASSESSMENT ID: LS-3016  
NASA FMEA #: 06-2-330003-1  
NASA DATA: 
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT  
MDAC ID: 3016  
ITEM: FIRE SUPPRESSANT PRESSURE SENSOR  
LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88  C-536
ASSESSMENT DATE: 2/15/88
ASSESSMENT ID: LS-3017
NASA FMEA #: 05-6V-2255-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3017
ITEM: DIODE-A4CR1, A4CR2, A4CR3
LEAD ANALYST: J.D. ARBET

NASA DATA:
BASELINE [ ]
NEW [ X ]

ASSESSMENT:
CRITICALITY REDUNDANCY SCREENS CIL
FLIGHT HDW/FUNC A B C ITEM
NASA [ 3 /1R ] [ P ] [ P ] [ P ] [ ] *
IOA [ 2 /2 ] [ ] [ ] [ ] [ X ]
COMPARE [ N /N ] [ N ] [ N ] [ N ] [ N ]

RECOMMENDATIONS: (If different from NASA)
[ / ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-537
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/15/88
ASSESSMENT ID: LS-3018
NASA FMEA #: 05-6V-2255-2
NASA DATA: BASELINE [ ] NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3018
ITEM: DIODE-A4CR1, A4CR2, A4CR3

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-538
APPENDIX C  
ASSESSMENT WORKSHEET

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SUBSYSTEM: LIFE SUPPORT  
MDAC ID: 3019  
ITEM: DIODE-A3CR1, A3CR2, A3CR3  
LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS:  
(If different from NASA)

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* CIL RETENTION RATIONALE:  
(If applicable)

ADEQUATE [ ]  
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-539
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3020
NASA FMEA #: 05-6V-2252-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3020
ITEM: DIODE-A3CR1, A3CR2, A3CR3
LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT OF ONE DIODE AND A SHORT (CLOSED) OF THE RESET SWITCH CONTACT ASSOCIATED WITH THAT DIODE WOULD INHIBIT THE HARDWARE ALARM CIRCUIT FOR ALL SENSORS UNTIL THE APPROPRIATE CIRCUIT BREAKER WAS OPENED THEN ONLY TWO AV BAY SENSORS (NON-REDUNDANT) WOULD BE LOST.

REPORT DATE 03/10/88 C-540
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/10/88
ASSESSMENT ID: LS-3021
NASA FMEA #: 05-6V-2077-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3021
ITEM: RESISTOR-A1R12
LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-541
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/10/88
ASSESSMENT ID: LS-3022
NASA FMEA #: 05-6V-2077-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3022
ITEM: RESISTOR-A1R12
LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88  C-542
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88  
ASSESSMENT ID: LS-3023  
NASA FMEA #: 05-6V-2076-1

NASA DATA:  
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT  
MDAC ID: 3023  
ITEM: RESISTOR A6R2, R4, R6, R8, R10, R14, R16, R18, R20 (5.1K)

LEAD ANALYST: J.D. ARBET  

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88  
C-543
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3024
NASA FMEA #: N/A
NASA DATA:
BASELINE [ ]
NEW [ ]
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3024
ITEM: RESISTOR A6R4, R6, R8, R10, R14, R16, R18, R20 (5.1K)
ASSIGNMENT DATE: 2/09/88
ASSESSMENT ID: LS-3024
NASA FMEA #: N/A
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RECOMMENDATIONS: (If different from NASA)
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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SHORTS (TO GROUND OR END-TO-END) ARE NOT CONSIDERED A CREDIBLE FAILURE FOR THIS TYPE RESISTOR.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3025
NASA FMEA #: 05-6V-2076-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3025
ITEM: RESISTOR A6R2 (CABIN)
LEAD ANALYST: R.E. DUFFY

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NEW [ ]

ASSESSMENT:

CRITICALITY REDUNDANCY SCREENS CIL ITEM

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
RESISTOR ONLY EFFECTS TELEMETRY INDICATION TO THE GROUND. THIS COMPONENT WAS ORIGINALLY ANALYZED AS PART OF LS-3023. ALSO, A SHORT END-TO-END IS THE ONLY CREDIBLE FAILURE MODE RELATED TO A RESISTOR SHORT.

REPORT DATE 03/10/88 C-545
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3026
NASA FMEA #: 05-6V-2074-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3026
ITEM: RESISTOR A6R1, R3, R5, R7, R9, R13, R15, R17, R19 (12K)

LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-546
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3027
NASA FMEA #: 05-6V-2075-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3027
ITEM: RESISTOR A1R1, R2, R3, R4, R5, R8, R9, R10, R11 (1.2K)
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ D ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE ALARM STILL WILL BE ISSUED VIA THE SMOKE CONCENTRATION FDA PARAMETER AND THE APPROPRIATE FIRE LIGHT WILL ILLUMINATE.

REPORT DATE 03/10/88 C-547
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/08/88
ASSESSMENT ID: LS-3028
NASA FMEA #: 05-6V-2075-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3028
ITEM: RESISTOR A1R2, R3, R4, R5, R8, R9, R10, R11 (1.2K)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
INITIAL IOA ANALYSIS BASE UPON A SHORT TO GROUND. A SHORT-TO-GROUND IS NOT CONSIDERED A CREDIBLE FAILURE FOR THIS TYPE RESISTOR.

REPORT DATE 03/10/88 C-548
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/08/88
ASSESSMENT ID: LS-3029
NASA FMEA #: 05-6V-2075-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3029
ITEM: RESISTOR A1R1
LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ X ]

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
[ ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
INITIAL IOA ANALYSIS BASE UPON A SHORT TO GROUND. A SHORT-TO-GROUND IS NOT CONSIDERED A CREDIBLE FAILURE FOR THIS TYPE RESISTOR.

REPORT DATE 03/10/88 C-549
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/08/88
ASSESSMENT ID: LS-3030
NASA FMEA #: 05-6V-2251-1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3030
ITEM: DIODE A1CR1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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| NASA | [ 3 /1R ] | [ P ] | [ F ] | [ P ] | [ X ] |
| IOA  | [ 3 /1R ] | [ P ] | [ P ] | [ P ] | [ ] |
| COMPARE | [ / ] | [ ] | [ N ] | [ ] | [ N ] |

RECOMMENDATIONS: (If different from NASA)

| [ 3 /1R ] | [ P ] | [ P ] | [ P ] | [ D ] |

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE FAILURE IS DETECTED BY THE SMOKE DETECTOR CONCENTRATION FDA ALERT AND SUBSEQUENT ANALYSIS.

REPORT DATE 03/10/88 C-550
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/08/88
ASSESSMENT ID: LS-3031
NASA FMEA #: 05-6V-2251-2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3031
ITEM: DIODE A1CR1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-551
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/08/88
ASSESSMENT ID: LS-3032
NASA FMEA #: N/A

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3032
ITEM: DIODE A1CRI, 2, 3, 4, 5, 8, 9, 10, 11

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ ] [ ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
JANTXVIN4246 DIODE IS NOT CONSIDERED TO SHORT-TO-GROUND.

REPORT DATE 03/10/88 C-552
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/08/88
ASSESSMENT ID: LS-3033
NASA FMEA #: 05-6V-2075-2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3033
ITEM: RESISTOR A6R11, R12 (1.2K)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ D ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THESE RESISTORS ONLY EFFECT THE PAYLOAD SMOKE DETECTION ALL OTHER ALARMS WORK TO INDICATE THE FIRE. BUT THE LOSS OF ALL LIKE AND UNLIKE REDUNDANCY (ALL ALARM OUTPUTS) COULD POSSIBLY RESULT IN LOSS OF THE CREW/VEHICLE.

REPORT DATE 03/10/88 C-553
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3034
NASA FMEA #: 05-6V-2075-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3034
ITEM: RESISTOR A6R11, R12 (1.2K)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

<p>| CRITICALLY | REDUNDANCY SCREENS | CIL | ITEM |</p>
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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ANALYSIS WAS BASED ON RESISTOR SHORT TO GROUND. CREDIBLE FAILURE IS RESISTOR SHORT END-TO-END. THE EFFECT OF AN END-TO-END SHORT IS LOSS OF CURRENT LIMITED TO THE PAYLOAD OUTPUT DRIVER TO THE SHUTTLE SMOKE DETECTION LAMP.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3035
NASA FMEA #: N/A

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3035
ITEM: RESISTOR A6R11, R12 (1.2K)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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NASA [ ] / [ ] [ ] [ ] [ ] [ ] [ ]
IOA [ 3 /1R ] [ P ] [ P ] [ P ] [ ] [ ]
COMPARE [ N /N ] [ N ] [ N ] [ N ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ ] / [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SHORTS (TO GROUND) ARE NOT CONSIDERED A CREDIBLE FAILURE FOR THIS TYPE RESISTOR.

REPORT DATE 03/10/88 C-555
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3036
NASA FMEA #: 05-6V-2251-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3036
ITEM: DIODE A6CR1, CR2

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ D ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ALL OTHER ALARMS WORK TO INDICATE THE FIRE AND THE SOURCE CAN BE IDENTIFIED BY SUBSEQUENT ANALYSIS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3037
NASA FMEA #: 05-6V-2251-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3037
ITEM: DIODE A6CR1, CR2

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-557
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/07/88
ASSESSMENT ID: LS-3038
NASA FMEA #: 05-6V-2074-1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3038
ITEM: RESISTOR A1R6, R7 (12K)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

CRITICALITY REDUNDANCY SCREENS CIL
FLIGHT HDW/FUNC A B C ITEM

NASA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ] [*]
IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]
COMPARE [ / ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)
[ / ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-558
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3039
NASA FMEA #: N/A

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3039
ITEM: RESISTOR A1R6, R7 (12K)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

CRITICALITY
FLIGHT
HDW/FUNC

REDUNDANCY SCREENS
A   B   C

NASA [ ] [ ] [ ] [ ] *[ ]

IOA [ 3 /1R ] [ P ] [ P ] [ P ] [ ]

COMPARE [ N /N ] [ N ] [ N ] [ N ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SHORTS (TO GROUND OR END-TO-END) ARE NOT CONSIDERED A CREDIBLE
FAILURE FOR THIS TYPE RESISTOR.

REPORT DATE 03/10/88  C-559
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3040
NASA FMEA #: N/A

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3040
ITEM: ANNUNCIATOR CONTROL ASSEMBLY (ACA) 1 AND 2

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

BASED UPON LOSS OF ALL ALARM ANNUNCATION REDUNDANCY (LIKE & UNLIKE) THE POSSIBILITY FOR LOSS OF CREW/VEHICLE EXISTS.

REPORT DATE 03/10/88 C-560
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3041
NASA FMEA #: N/A
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3041
ITEM: ANNUNCIATOR CONTROL ASSEMBLY (ACA) 1 AND 2
LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LAMP ILLUMINATION WITH NO OTHER ALARMS ONLY REQUIRES ANALYSIS TO ENSURE NO FIRE EXISTS.

REPORT DATE 03/10/88      C-561
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3042
NASA FMEA #: 05-6V-2311-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3042
ITEM: SMOKE DETECTION LIGHT MATRIX-LAMPS

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ D ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FAILURE CAN BE DETECTED INFLIGHT WHEN ALARMS ANNUNCIATE THE FIRE
BUT LIGHT DOES NOT. SOFTWARE FDA PROVIDES SOURCE OF FIRE.

REPORT DATE 03/10/88 C-562
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3043
NASA FMEA #: N/A

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3043
ITEM: C&W ELECTRONICS UNIT SIREN A & B

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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ASSESSMENT:

| NASA DATA: | BASELINE [ ] | NEW [ ] |

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3043
ITEM: C&W ELECTRONICS UNIT SIREN A & B

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

| [ 3 /1R ] | [ P ] | [ P ] | [ P ] | [ ] |

* CIL RETENTION RATIONALE: (If applicable)

Adequate [ ]
Inadequate [ ]

REMARKS:

LOSS OF ALL REDUNDANCY (ALARM ANNUNCIATIONS) COULD RESULT IN LOSS OF CREW/VEHICLE.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3044
NASA FMEA #: 05-6V-2026-4

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3044
ITEM: SWITCH-FIRE SUPPRESSION AV BAY 1, 2, 3 ARM/SAFE (S1, 2, 3)
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-564
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3045
NASA FMEA #: 05-6V-2071-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3045
ITEM: RESISTOR-NO IDENTIFIER (2.2K)
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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IOA [ 3 / 3 ] [ ] [ ] [ ] [ ] [ ] COMPAR [ / ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ] INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-565
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
NASA DATA:
ASSESSMENT ID: LS-3046
BASELINE [ ]
NASA FMEA #: N/A
NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3046
ITEM: RESISTOR-N O IDENTIFIER (2.2K)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SHORTS (TO GROUND OR END-TO-END) ARE NOT CONSIDERED A CREDIBLE FAIL URE FOR THIS TYPE RESISTOR.

REPORT DATE 03/10/88 C-566
### APPENDIX C
#### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 2/09/88  
**NASA DATA:**  
**ASSESSMENT ID:** LS-3047  
**NASA FMEA #:** 05-6V-2072-1  
**SUBSYSTEM:** LIFE SUPPORT  
**MDAC ID:** 3047  
**ITEM:** RESISTOR—NO IDENTIFIER (1.8K)  
**LEAD ANALYST:** J.D. ARBET

**ASSESSMENT:**

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**RECOMMENDATIONS:** (If different from NASA)

| [ / ] | [ ] | [ ] | [ ] | [ ] | (ADD/DELETE) |

* **CIL RETENTION RATIONALE:** (If applicable)
  
  ADEQUATE [ ]  
  INADEQUATE [ ]

**REMARKS:**

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**REPORT DATE 03/10/88**  
**C-567**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88  NASA DATA:
ASSESSMENT ID:  LS-3048  BASELINE [ ]
NASA FMEA #:  05-6V-2028-4  NEW [ ]
SUBSYSTEM:  LIFE SUPPORT
MDAC ID:  3048
ITEM:  SWITCH-FIRE SUPPRESSION AV BAY 1, 2, 3 AGENT DISCH (S4, S5, S6)
LEAD ANALYST:  J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

Adequate [ ]
Inadequate [ ]

REMARKS:

REPORT DATE 03/10/88  C-568
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3049
NASA FMEA #: 05-06-2310-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3049
ITEM: LIGHT-FIRE SUPPRESSION AV BAY 1, 2, 3 AGENT DISCH (S4, S5, S6)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

COMPARE [ / ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)
[ / ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE IOA ANALYSIS WORKSHEET ERRONEOUSLY LISTS THE FAILURE AS PREMATURE OPERATION. THE FAILURE MODE SHOULD BE FAILS OPEN.

REPORT DATE 03/10/88 C-569
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/10/88
ASSESSMENT ID: LS-3050
NASA FMEA #: N/A
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3050
ITEM: ANNUNCIATOR CONTROL ASSEMBLY (ACA) 3
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

Adequate [ ]
Inadequate [ ]

REMARKS:
FAILURE CAN BE DETECTED INFLIGHT WHEN ALARMS ANNUNCIATE THE FIRE BUT LIGHT DOES NOT. SOFTWARE FDA PROVIDES SOURCE OF FIRE. POSSIBLE LOSS OF CREW/VEHICLE IF ALL REDUNDANT ALARM ANNUNCIATION IS LOST.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/10/88
ASSESSMENT ID: LS-3051
NASA PMEA #: N/A

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3051
ITEM: ANNUNCIATOR CONTROL ASSEMBLY (ACA) 3

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ][ ]

(ADD/DELETE)

* CIL RETENTION RATIONAL: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LAMP ILLUMINATION WITH NO OTHER ALARMS ONLY REQUIRES ANALYSIS TO ENSURE NO FIRE EXISTS.

REPORT DATE 03/10/88 C-571
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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-572
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/10/88
ASSESSMENT ID: LS-3053
NASA FMEA #: 05-06-2254-3
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3053
ITEM: DIODE-NO IDENTIFIER
LEAD ANALYST: J.D. ARBET

NASA DATA:
BASELINE [ ]
NEW [ X ]

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT OF THIS DIODE HAS NO EFFECT ON THE FLIGHT CIRCUIT AND
WOULD ONLY ALLOW AN ERRORONEOUS TELEMETRY INDICATION IF THE
GROUND CIRCUIT IS ACTIVATED.

REPORT DATE 03/10/88 C-573
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/09/88
ASSESSMENT ID: LS-3054
NASA FMEA #: 05-6V-2253-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3054
ITEM: DIODE-NO IDENTIFIER
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ D ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
POST LAUNCH, OPEN ACTUALLY ISOLATES THE GROUND CIRCUIT BETTER THAN ANY OTHER CONDITION AND DOES NOT EFFECT THE FLIGHT CIRCUIT PRE-LAUNCH THE CIRCUIT PROVIDES CAPABILITY TO FIGHT A FIRE THROUGH GROUND COMMAND CAPABILITIES. THIS DIODE, THE ON BOARD CIRCUIT, AND THE PORTABLE BOTTLES MUST FAILS TO RESULT IN LOSS OF CREW/VEHICLE. CONSIDERATIONS OF PREMATURE FIRING ARE ACTUALLY A FAIL SAFE CONDITION.

REPORT DATE 03/10/88 C-574
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3055
NASA FMEA #: 05-6V-2073-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3055
ITEM: RESISTOR-NO IDENTIFIER (5.11K)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ D ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

THE FAILURE HAS NO EFFECT ON THE FLIGHT CIRCUIT THUS THE ONLY CONSIDERATION IS ON THE LAUNCH PAD. FAILURE OF THE GROUND SYSTEMS TO DISCHARGE THE SUPPRESSANT CONTAINER IS BACKED UP BY THE FLIGHT SYSTEM, PORTABLE BOTTLES, AND LAUNCH TOWER FIRE SYSTEMS.

REPORT DATE 03/10/88 C-575
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: LS-3056
NASA FMEA #: 05-6V-2302-3
NASA DATA:
BASELINE [ ]
NEW [ x ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3056
ITEM: PYRO CONTROLLER NO. 1, 2, 3

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-576
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: LS-3057
NASA FMEA #: 05-6V-2302-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3057
ITEM: PYRO CONTROLLER NO. 1, 2, 3

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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IOA [ 2 /2 ] [ ] [ ] [ ] [ ] [ X ]

COMPARE [ N /N ] [ N ] [ N ] [ N ] [ N ]

RECOMMENDATIONS: (If different from NASA)

[ 1 /1 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A PREMATURE OPERATION OF THIS CIRCUIT (SHORT INTERNAL) CAN INHIBIT THE ACTUAL FIRE VOLTAGE BY NOT ALLOWING THE CAPACITOR VOLTAGE TO BUILD UP. THUS THE WORST CASE CRITICALITY IS 1/1. IF THE NSI CAN FIRE AT A LOWER VOLTAGE OR IF THE FAILURE FIRES THE NSI PRIOR TO THE ACTUAL FIRE COMMAND THE FAILURE WOULD BE A CRITICALITY 3/3 SINCE THE DESIRE RESULTS ARE ACHieved.

REPORT DATE 03/10/88 C-577
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/10/88
ASSESSMENT ID: LS-3058
NASA FMEA #: 06-2-311000-01

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3058
ITEM: SMOKE DETECTOR (9)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
MOST LOGICAL FAILURE IS THE LOSS OF FLOW TO THE SENSING CHAMBERS
SO THAT BOTH THE STATUS OUTPUT AND THE CONCENTRATION OUTPUT ARE
AFFECTED.

REPORT DATE 03/10/88 C-578
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/10/88
ASSESSMENT ID: LS-3059
NASA FMEA #: 06-2-330001-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3059
ITEM: FIRE SUPPRESSANT ASSEMBLY (9)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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| IOA  | [ 2 /2 ] | [ ] | [ ] | [ ] | [ X ] |
| COMPARE | [ N /N ] | [ ] | [ ] | [ ] | [ ] |

NASA DATA:
BASELINE [ ]
NEW [ X ]

RECOMMENDATIONS: (If different from NASA)
[ 2 /1R ] [ P ] [ P ] [ P ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE Requires MORE THOUGHT THAN ONE FMEA/CIL: 1) THE FAILURE BY ITSELF SHOULD BE INDICATED BY ILLUMINATION OF THE AGENT DISCHARGE LIGHT. UPON DISCHARGE (ASSUMING A HIGH LEAD RATE) THE AV BAY WOULD BE PROTECTED FOR UP TO 50 HRS. THUS THE FAILURE ONLY HAS MISSION TERMINATION EFFECTS AND LOSS OF CREW/VEHICLE ARE NOT THE CONCERN; 2) THE FAILURE ASSUMING A SLOW LEAK WOULD REDUCE THIS AV BAY PROTECTION TIME BUT DETECTION WOULD STILL BE INDICATED VIA THE AGENT DISCHARGE LIGHT. IF THE RATE IS SLOW ENOUGH IT WILL BE DETECTED BY GROUND CHECKOUT BETWEEN MISSION; 3) THE MAJOR PROBLEM IS IF FOLLOWING GROUND CHECKOUT THE RESISTOR THAT PROVIDES CURRENT LIMITING FOR THE CIRCUIT FAILS OPEN OR THE PRESSURE SWITCH CONTACT FAILS CLOSED, OR THE CIRCUIT IS SHORTED TO GROUND NO AGENT DISCHARGE LIGHT ILLUMINATION CAN TAKE PLACE AND THEN THIS FAILURE CAN BE CATASTROPHIC IF THE LEAK IS UNDETECTED AND COMPLETE PRIOR TO LIFT-OFF. THUS THE FAILURE WOULD APPEAR AS A 1R/2.

REPORT DATE 03/10/88 C-579
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/11/88
ASSESSMENT ID: LS-3060
NASA FMEA #: 06-2-330005-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3060
ITEM: FIRE SUPPRESSANT ASSEMBLY (9)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-580
ASSSESSMENT DATE: 2/11/88
NASA DATA:
ASSSESSMENT ID:  LS-3060A
NASA FMEA #: 06-2-330005-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3060
ITEM: FIRE SUPPRESSANT ASSEMBLY (9)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-581
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/11/88
ASSESSMENT ID: LS-3060B
NASA FMEA #: 06-2-330050-2
NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3060
ITEM: FIRE SUPPRESSANT ASSEMBLY (9)

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)
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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-582
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/11/88
ASSESSMENT ID: LS-3061
NASA FMEA #: 06-2-371000-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3061
ITEM: PORTABLE FIRE SUPPRESSANT ASSEMBLY

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSS OF ALL REDUNDANCY (ALL PORTABLE BOTTLES) COULD RESULT IN LOSS OF CREW/VEHICLE.

REPORT DATE 03/10/88 C-583
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/11/88
ASSESSMENT ID: LS-3062
NASA FMEA #: 06-2-371000-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3062
ITEM: PORTABLE FIRE SUPPRESSANT ASSEMBLY

LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM:

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COMPARE [ / ] [ N ] [ N ] [ ] [ N ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ F ] [ P ] [ P ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A JAMMED ACTUATOR WILL BE KNOW IMMEDIATELY UPON USAGE.

REPORT DATE 03/10/88 C-584
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/08/88
ASSESSMENT ID: LS-3063
NASA FMEA #: 05-6V-2204-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3063
ITEM: HYBRID DRIVER (TYPE III) (3)
LEAD ANALYST: R.E. DUFFY

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| IOA | 3 /3 | | | | |
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RECOMMENDATIONS: (If different from NASA)

| 3 /1R | P | P | P | D | (ADD/DELETE) |

* CIL RETENTION RATIONALE: (If applicable)

| ADEQUATE | | |
| INADEQUATE | | |

REMARKS:
THE FAILURE HAS NO EFFECT ON THE FLIGHT CIRCUIT THUS THE ONLY CONSIDERATION IS ON THE LAUNCH PAD. FAILURE OF THE GROUND SYSTEMS TO DISCHARGE THE SUPPRESSANT CONTAINER IS BACKED UP BY THE FLIGHT SYSTEM, PORTABLE BOTTLES, AND LAUNCH TOWER FIRE SYSTEMS.

REPORT DATE 03/10/88 C-585
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/07/88
ASSESSMENT ID: LS-3064
NASA FMEA #: 05-6V-2203-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3064
ITEM: HYBRID DRIVER (TYPE I) (3)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

| [ 3 /1R ] | [ P ] | [ P ] | [ P ] | [ D ] |
|           |      |      |      | (ADD/DELETE) |

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE FAILURE HAS NO EFFECT ON THE FLIGHT CIRCUIT THUS THE ONLY
CONSIDERATION IS ON THE LAUNCH PAD. FAILURE OF THE GROUND
SYSTEMS TO DISCHARGE THE SUPPRESSANT CONTAINER IS BACKED UP BY
THE FLIGHT SYSTEM, PORTABLE BOTTLES, AND LAUNCH TOWER FIRE
SYSTEMS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/07/88
ASSESSMENT ID: LS-3065
NASA FMEA #: 05-6V-2202-3
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3065
ITEM: HYBRID DRIVER (TYPE II) (3)
LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-587
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3112X
NASA FMEA #: 05-6V-2027-4

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3112
ITEM: SWITCH-SMOKE DETECTOR SENSOR RESET (57)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-588
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/06/88
ASSESSMENT ID: LS-3114X
NASA FMEA #: 05-6V-2029-4
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3114
ITEM: SW-SMOKE DETECTOR CIRCUIT TEST (S8)

LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
EVEN WITH THE WORST CASE FAILURE REDUNDANT SENSING IS AVAILABLE IN ALL AREAS. EACH SENSOR STILL PROVIDES SMOKE CONCENTRATION DATA FOR FDA COMPUTATION.

REPORT DATE 03/10/88 C-589
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/09/88
ASSESSMENT ID: LS-3144X
NASA PMEA #: 05-06-2026-3
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3144
ITEM: SWITCH-FIRE SUPPRESSION AV BAY 1, 2, 3, ARM/SAFE (S1,S2,S3)

LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-590
APPENDIX C
ASSESSMENT WORKSHEET

ASSesseMENT DATE: 1/06/88
ASSesSMENT ID: LS-3148X
NASA FMEA #: 05-6V-2028-3

NASa DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3148
ITEM: SW-FIRE SUPPRESSION AV BAY 1, 2, 3 AGENT DISCH

LEAD ANALYST: J.D. ARBET

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COMPARE | [ N / ] | [ ] | [ N ] | [ ] | [ N ] |

RECOMMENDATIONS: (If different from NASA)

[ 2 /1R ] [ P ] [ P ] [ P ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ A ]
INADEQUATE [ ]

REMARKS:
THE FAILURE COUPLED WITH A FAILURE OF THE ONE SECOND TIME DELAY CAN INHIBIT THE DISCHARGE OF THE FIRE SUPPRESSANT CONTAINER. WORST CASE IS DURING ASCENT AND DEORBIT.

REPORT DATE 03/10/88 C-591
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/09/88
ASSESSMENT ID: LS-3154X
NASA FMEA #: 05-6V-2253-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3154
ITEM: DIODE-NO IDENTIFIER

LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE AS RUN GROUND TURNAROUND TEST UNDER MOST CONDITIONS WILL NOT DETECT THE FAILURE.

REPORT DATE 03/10/88 C-592
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/15/88
ASSESSMENT ID: LS-3158X
NASA FMEA #: 06-2-311000-02

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3158
ITEM: SMOKE DETECTOR (9)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

Adequate [ ]

Inadequate [ ]

REMARKS:

REPORT DATE 03/10/88 C-593
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/08/88
ASSESSMENT ID: LS-3163X
NASA FMEA #: 05-06-2204-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3163
ITEM: HYBRID DRIVER (TYPE III) (3)

LEAD ANALYST: J.D. ARBET

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-594
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/08/88                      NASA DATA:
ASSESSMENT ID: LS-3164X                        BASELINE [ ]
NASA FMEA #: 05-6V-2203-2                        NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3164
ITEM: HYBRID DRIVER (TYPE I) (3)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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COMPARE [ N /N ] [ N ] [ N ] [ N ] [ ]

RECOMMENDATIONS: (If different from NASA)
[ 2 /1R ] [ P ] [ P ] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
PRELAUNCH PORTABLE BOTTLES ARE AVAILABLE TO DISCHARGE SUPPRESSANT INTO THE BAY. THIS IS ALSO TRUE FOR ONORBIT AND LANDING/SAFING. DURING LIFT OFF AND DEORBIT, A FAILURE OF THE PRE-FLIGHT BUS WOULD BE REQUIRED TO ISSUE THE COMMAND VIA THIS FAILURE.

REPORT DATE 03/10/88          C-595
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/07/88
ASSESSMENT ID: LS-3165X
NASA FMEA #: 05-6V-2202-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3165
ITEM: HYBRID DRIVER (TYPE II) (3)

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

CRITICALITY REDUNDANCY SCREENS CIL
FLIGHT HDW/FUNC A B C ITEM

NASA [ 1 /1 ] [ ] [ ] [ ] [ ] [ X ] *
IOA [ 1 /1 ] [ ] [ ] [ ] [ ] [ X ]
COMPARE [ / ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)
[ / ] [ ] [ ] [ ] [ ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-596
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/07/88
ASSESSMENT ID: LS-3166X
NASA FMEA #: 05-6V-2201-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3166
ITEM: HYBRID DRIVER (TYPE I) - SMOKE DETECTOR GROUND RESET

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ D ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
The failure is detectable through the redundant sensing capability.

REPORT DATE 03/10/88 C-597
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/07/88
ASSESSMENT ID: LS-3167X
NASA FMEA #: 05-6V-2201-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3167
ITEM: HYBRID DRIVER (TYPE I) - SMOKE DETECTOR GROUND
RESET

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-598
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/16/88
ASSESSMENT ID: LS-3168X
NASA FMEA #: 06-2-330050-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3168
ITEM: NASA STANDARD INITIATOR

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE FAILURE WILL BE NOTED INFLIGHT WHEN THE AGENT DISCHARGE LIGHT ILLUMINATES AND VIA THE TELEMETRY PARAMETER.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/15/88
ASSESSMENT ID: LS-3258X
NASA FMEA #: 06-2-311000-03
NASA DATA:
BASELINE [    ]
NEW [  X  ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3258
ITEM: SMOKE DETECTOR (9)
LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /1R ] [ F ] [ F ] [ P ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [   ]
INADEQUATE [   ]

REMARKS:
DURING GROUND TURNAROUND TEST THE ONLY TRUE TEST OF THE
CONCENTRATION PARAMETER WOULD BE TO VERIFY A KNOWN CONCENTRATION
LEVEL WHICH THE PROCEDURES DO NOT ATTEMPT. SIMILAR LOGIC APPLIES
TO THE INFLIGHT CASE.

REPORT DATE 03/10/88 C-600
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 2/16/88
ASSESSMENT ID: LS-3268X
NASA FMEA #: 06-2-330050-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3268
ITEM: NASA STANDARD INITIATOR

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

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NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3268
ITEM: NASA STANDARD INITIATOR

LEAD ANALYST: J.D. ARBET

ASSESSMENT:

CRITICALITY
FLIGHT HDW/FUNC

RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-601
C.4

AIRLOCK SUPPORT SYSTEM

ASSESSMENT WORKSHEETS
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5001
NASA FMEA #: 05-6UA-2017-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5001
ITEM: VISUAL PRESSURE GAUGE
LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ X ]

ASSESSMENT:

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COMPARE [ / ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88  C-603
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5002
NASA FMEA #: 06-1-1207-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5002
ITEM: ECLSS H2O SUPPLY PRESS. SENSOR (V64-P0201A)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5002. LOSS OF PRESSURE INDICATION DOES NOT LEAD TO "DEADHEADING" OF FUEL CELLS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5003
NASA FMEA #: 06-1-1206-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5003
ITEM: EMU WATER SUPPLY VALVE (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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| IOA [2/2]        | [ ]       | [ ] | [ ] |   | [X] |
| COMPARE [N/N]    | [N]       | [N] | [N] |   | [N] |

RECOMMENDATIONS: (If different from NASA)

[2/2] [ ] [ ] [ ] [A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FUNCTIONAL LOSS IS LOSS OF MISSION. THE AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES SPECIFICATION NSTS 22206. FOR WORST CASE ANALYSIS SEE IOA ANALYSIS #5003.

REPORT DATE 03/10/88 C-605
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5004
NASA FMEA #: 06-1-1206-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5004
ITEM: EMU WATER SUPPLY VALVE (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [P] [P] [P] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5004. LOSS OF THE FUNCTION TO SEAL THE WATER ON THE LINE DOES NOT LEAD TO LOSS OF FES. A REVALVING OF THE SUPPLY WATER SYSTEM WILL CORRECT THE FAILURE; HOWEVER EVA MISSIONS ARE STILL LOST.

REPORT DATE 03/10/88 C-606
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5005
NASA FMEA #: 06-1-1206-3
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5005
ITEM: EMU WATER SUPPLY VALVE (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ A ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

SEE IOA ANALYSIS #5005. LOSS OF THE FUNCTION TO SEAL THE WATER ON THE LINE DOES NOT LEAD TO LOSS OF FES. A REVALVING OF THE SUPPLY WATER SYSTEM WILL CORRECT THE FAILURE; HOWEVER EVA MISSIONS ARE STILL LOST.

REPORT DATE 03/10/88 C-607
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5006
NASA FMEA #: 05-6UA-2008-1
NASA DATA: BASELINE [  ]
BASELINE [  ]
NEW [  X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5006
ITEM: EMU WATER SUPPLY SWITCH (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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| IOA [ 2 /2 ] |  [ ] [ ] [ ] [  ] | [ X ] |
| COMPARE [ N /N ] | [ N ] [ N ] [ N ] [ N ] | [ N ] |

RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [  ] [  ] [  ] [  ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [  ]
INADEQUATE [  ]

REMARKS:
SEE IOA ANALYSIS #5006. FUNCTIONAL LOSS IS LOSS OF MISSION. THE AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS OF DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES SPECIFICATION NSTS 22206. FOR WORST CASE ANALYSIS SEE IOA ANALYSIS #5003.

REPORT DATE 03/10/88 C-608
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5006A
NASA FMEA #: 05-6UA-2008-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5006
ITEM: EMU WATER SUPPLY SWITCH (2)

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

SEE IOA ANALYSIS #5006. FUNCTIONAL LOSS IS LOSS OF MISSION. THE AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES SPECIFICATION NSTS 22206. FOR WORST CASE ANALYSIS SEE IOA ANALYSIS #5003.

REPORT DATE 03/10/88 C-609
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5007
NASA FMEA #: 05-6UA-2012-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5007
ITEM: EMU WATER SUPPLY STATUS INDICATOR (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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COMPARE [ / ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ITEM IS NOT MISSION ESSENTIAL.

REPORT DATE 03/10/88 C-610
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5008
NASA FMEA #: 05-6UA-2005-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5008
ITEM: RESISTOR (A1R1 AND A2R1)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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NASA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ] [ ] *

RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REPORT DATE 03/10/88 C-611
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5009
NASA FMEA #: 05-6UA-2000-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5009
ITEM: EMU WATER SUPPLY CIRCUIT BREAKER (2)

LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM:
MDAC ID:
ITEM:
LEAD ANALYST:
ASSESSMENT:

ASSESSMENT:

CRITICALITY
FLIGHT
HDW/FUNC
NASA [ 3 /1R ]
IOA [ 2 /2 ]
COMPARE [ N /N ]

REDUNDANCY SCREENS
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[ P ]
[ NA]
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ITEM

CIL

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RECOMMENDATIONS: (If different from NASA)
[ 2 /2 ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SAME SCENARIO (WORST CASE) AS FOR VALVE FAILED CLOSED (#5003).
NASA DATA IS NOT AVAILABLE, BUT IOA & NASA'A CRITICALITIES ARE
CONSISTENT WITH #5003 & 06-1A-1206-1 THUS, THE ISSUE FOLLOWS THE
LOGIC OF ASSESSMENT #5003.

REPORT DATE 03/10/88 C-612
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5010
NASA FMEA #: 05-6UA-2000-2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5010
ITEM: EMU WATER SUPPLY CIRCUIT BREAKER (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-613
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5011
NASA FMEA #: 06-1-1212-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5011
ITEM: EMU WASTE WATER VALVE (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ]  [ ]  [ ]  [ ]  [ ]  [ A ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5011. PRE 51-L ANALYSIS SAYS LOSS OF REDUNDANCY. HOWEVER, WITH TWO SUITED CREWMAN, THERE IS NO REDUNDANCY, THUS LOSS OF MISSION.

REPORT DATE 03/10/88 C-614
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5012
NASA FMEA #: 06-1-1212-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5012
ITEM: EMU WASTE WATER VALVE (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

CRITICALITY REDUNDANCY SCREENS CIL ITEM
FLIGHT HDW/FUNC A B C

NASA [ 3 /1R ] [ P ] [ NA] [ P ] [ ] *
IOA [ 3 /3 ] [ ] [ ] [ ] [ ]

COMPARE [ /N ] [ N ] [ N ] [ N ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5012. FUNCTIONAL LOSS IS LOSS OF MISSION. THE AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES SPECIFICATION NSTS 22206. FOR WORST CASE ANALYSIS SEE IOA ANALYSIS #5003.

REPORT DATE 03/10/88 C-615
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5013
NASA FMEA #: 06-1-1212-3
NASA DATA: BASELINE [ ] NEW [ X ]
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5013
ITEM: EMU WASTE WATER VALVE (2)
LEAD ANALYST: R.E. DUFFY

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| COMPARE | /N | [ N ] | [ N ] | [ N ] | [ ] |

RECOMMENDATIONS: (If different from NASA)
[ 3 /2R ] [ P ] [ P ] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FUNCTIONAL CRIT 2R IS USED DUE TO THE FREE WATER IN THE CABIN AND THE FACT THAT THE CREWMEN MAY NOT USE THE DRAIN TO SERVICE THE EMU WATER TANKS.
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88  
ASSESSMENT ID:  LS-5014  
NASA FMEA #:  05-6UA-2009-1  
SUBSYSTEM:  LIFE SUPPORT  
MDAC ID:  5014  
ITEM:  EMU WASTE WATER SWITCH (2)  
LEAD ANALYST:  R.E. DUFFY  

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

SAME SCENARIO (WORST CASE) AS FOR VALVE FAILED CLOSED (#5011), (NASA 06-1-1212-1). WITH TWO SUITED CREWMAN THERE IS NO REDUNDANCY THUS LOSS OF MISSION.

REPORT DATE 03/10/88  
C-617
APPENDIX C
ASSESSMENT WORKSHEET

ASSSESSMENT DATE: 3/08/88
ASSSESSMENT ID: LS-5014A
NASA FMEA #: 05-6UA-2009-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5014
ITEM: EMU WASTE WATER SWITCH (2)
LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ X ]

CRITICALITY
FLIGHT
HDW/FUNC

REDUNDANCY SCREENS
A   B   C

CIL
ITEM

NASA [ 3 /2R ]
[ P ]   [ NA ]   [ P ]

[ ]   [ X ]

IOA [ 2 /2 ]
[ ]   [ ]   [ ]

COMPARE [ N /N ]
[ N ]   [ N ]   [ N ]

RECOMMENDATIONS: (If different from NASA)
[ 2 /2 ]
[ ]   [ ]

[ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SAME SCENARIO (WORST CASE) AS FOR VALVE FAILED CLOSED (#5011),
(NASA 06-1-1212-1). WITH TWO SUITED CREWMAN THERE IS NO
REDUNDANCY, THUS MISSION LOSS.

REPORT DATE 03/10/88 C-618
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5015
NASA FMEA #: 05-6UA-2013-2
NASA DATA: BASELINE [ ] NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5015
ITEM: EMU WASTE WATER STATUS INDICATOR (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-619
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5016
NASA FMEA #: 05-6UA-2005-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5016
ITEM: RESISTOR (A1R2 AND A2R2)
LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-620
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5017
NASA FMEA #: 05-6UA-2001-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5017
ITEM: EMU WASTE WATER CIRCUIT BREAKER (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[2/2] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

SEE IOA ANALYSIS #5017. ASSUMING TWO CREWMEN THERE IS NO REDUNDANCY FOR EACH CREWMEN. THUS LOSS OF CB FORCES THE VALVE TO REMAIN CLOSED AND LOSS OF MISSION.

REPORT DATE 03/10/88 C-621
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5018
NASA FMEA #: 05-6UA-2001-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5018
ITEM: EMU WASTE WATER CIRCUIT BREAKER (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88  C-622
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5019
NASA FMEA #: 06-1-1210-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5019
ITEM: EMU WATER SUPPLY AND WASTE COUPLINGS
LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

[ /NA ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

HARDWARE HAS BEEN DELETED AND IS NOT FLOWN. (PER H. ROTTER PRCB PRESENTATION SSV-87-92)

REPORT DATE 03/10/88 C-623
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5020
NASA FMEA #: 06-1-1208-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5020
ITEM: EMU WATER SUPPLY LINES AND FITTING

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5020. FUNCTIONAL LOSS LEADS TO INABILITY TO SERVICE THE EMU'S. HOWEVER, AIRLOCK IS NOT AN EMERGENCY ITEM. FOR FURTHER EXPLANATION SEE ASSESSMENT #5003.

REPORT DATE 03/10/88 C-624
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5021
NASA FMEA #: 06-1-1209-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5021
ITEM: EMU WASTE WATER LINES AND FITTINGS
LEAD ANALYST: R.E. DUFFY

NASDATA: BASELINE [ ]
NEW [ X ]

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RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ P ] [ P ] [ ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5021. FUNCTIONAL LOSS LEADS TO INABILITY TO SERVICE THE EMU'S.

REPORT DATE 03/10/88 C-625
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5022
NASA FMEA #: NASA DATA:
MDAC ID: 5022 BASELINE [ ]
ITEM: O2 SUPPLY LINES AND FITTINGS NEW [ ]

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /1R ] [ P ] [ P ] [ P ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EXISTING EQUIVALENT NASA FMEA WAS FOUND FOR THIS FAILURE (SEE IOA ANALYSIS #5022).

REPORT DATE 03/10/88 C-626
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5023
NASA FMEA #: 05-6UA-2016-1

NASA DATA: BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5023
ITEM: VISUAL O2 PRESSURE GAUGE (1)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ] [ ]
COMPARISON [ / ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-627
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5024
NASA FMEA #: 06-1-1202-1

NASA DATA:
BASELINE []
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5024
ITEM: 02 SUPPLY PRESSURE SENSOR (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88  C-628
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5025
NASA FMEA #: 06-1-1201-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5025
ITEM: EMU 02 SUPPLY VALVE (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[2 /2] [ ] [ ] [ ] [A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5025. ASSUMING A BASELINE OF TWO SUITED CREWMEMBERS AND NO CREW ACTION (RULE 2.3.3.f OF NSTS 22206). TWO CREWMEMBERS SHARING ONE SCU IS NOT A "NOMINAL CREW ACTION", THUS LOSS OF MISSION.

REPORT DATE 03/10/88 C-629
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5026
NASA FMEA #: 06-1-1201-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5026
ITEM: EMU O2 SUPPLY VALVE (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
[ 3 /2R ] [ P ] [ P ] [ P ]

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5026. LOSS OF O2 ISOLATION FUNCTION LEADS TO LOSS OF EVA AND SHUTTLE MISSION. THIS IS BECAUSE LV3 AND LV4 WOULD BE CLOSED, AND THIS ACTION ISOLATES THE LEH'S. THUS, UPON FUNCTION LOSS, THE MISSION IS TERMINATED AND DEORBIT PLANNED FOR THE NEXT PLS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5027
NASA FMEA #: 06-1-1201-3
ASSESSMENT ID: LS-5027
NASA FMEA #: 06-1-1201-3
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5027
ITEM: EMU O2 SUPPLY VALVE (2)
LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ X ]

ASSESSMENT:

<p>| CRITICALITY | REDUNDANCY SCREENS | CIL |</p>
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RECOMMENDATIONS: (If different from NASA)

[ 1 /1 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FURTHER TO IOA ANALYSIS #5027. SHUTTLE MISSION IS LOST AND UNDER WORST CASE SCENARIO AN AOA CAN BE PERFORMED. HIGH PP02 CREATES A FIRE HAZARD WHICH HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE. THERE IS NO LOSS OF O2 TO LEH'S IF SYSTEM IS KEPT OPEN, THAT IS, O2 WILL BE DISTRIBUTED ACROSS THE SYSTEM PER BERNOULLIS EQUATION. THE ENVIRONMENT PRESSURE IS THE SAME FOR ALL PARTS OF THIS SYSTEM.

REPORT DATE 03/10/88 C-631
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5028
NASA FMEA #: 06-1-1205-3
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5028
ITEM: EMU O2 SUPPLY COUPLINGS
LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ X ]

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /1R ] [ P ] [ P ] [ P ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-632
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5029
NASA FMEA #: 06-1-1128-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5029
ITEM: DEPRESS CAP VENT (1)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FUNCTIONAL LOSS IS LOSS OF MISSION. THE AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES SPECIFICATION NSTS 22206. FOR WORST CASE ANALYSIS SEE IOA ANALYSIS #5003.

REPORT DATE 03/10/88 C-633
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5030
NASA FMEA #: 06-1-1127-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5030
ITEM: CAP VENT DEBRIS SCREEN (1)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FUNCTIONAL LOSS IS LOSS OF MISSION. THE AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES SPECIFICATION NSTS 22206. FOR WORST CASE ANALYSIS SEE IOA ANALYSIS #5003.

REPORT DATE 03/10/88 C-634
**APPENDIX C**

**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 3/08/88  
**ASSESSMENT ID:** LS-5031  
**NASA FMEA #:** 06-1-1127-1  
**SUBSYSTEM:** LIFE SUPPORT  
**MDAC ID:** 5031  
**ITEM:** CAP VENT DEBRIS SCREEN (1)  
**LEAD ANALYST:** R.E. DUFFY

**ASSESSMENT:**

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**COMPARE**

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**RECOMMENDATIONS:** (If different from NASA)

| [ ] | [ ] | [ ] | [ ] | [ ] | [A] |

* **CIL RETENTION RATIONALE:** (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

**REMARKS:**

FUNCTIONAL LOSS IS LOSS OF MISSION. THE AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES SPECIFICATION NSTS 22206. FOR WORST CASE ANALYSIS SEE IOA ANALYSIS #5003.

**REPORT DATE 03/10/88**

C-635
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5032
NASA FMEA #: 06-1-1128-3

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5032
ITEM: DEPRESS VALVE/CAP (1 EACH)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-636
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5032A
NASA FMEA #: 06-1-1126-4

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5032
ITEM: DEPRESS VALVE/CAP (1 EACH)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ F ] [ P ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

REPORT DATE 03/10/88 C-637
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5033
NASA FMEA #: 06-1-1126-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5033
ITEM: DEPRESS VALVE (1)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

CRITICALITY REDUNDANCY SCREENS CIL ITEM
FLIGHT HDW/FUNC A B C ITEM

NASA [ 3 /1R ] [ P ] [ P ] [ P ] [ ] *
IOA [ 2 /2 ] [ ] [ ] [ ] [ X ]
COMPARE [ N /N ] [ N ] [ N ] [ N ] [ N ]

RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FUNCTIONAL LOSS IS LOSS OF MISSION. THE AIRLOCK IS NOT AN
EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS DUE
TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND
FAILURE WHICH VIOLATES SPECIFICATION NSTS 22206. FOR WORST CASE
ANALYSIS SEE IOA ANALYSIS #5003.

REPORT DATE 03/10/88 C-638
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5034
NASA FMEA #: 06-1-1126-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5034
ITEM: DEPRESS VALVE/CAP (1 EACH)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[3 /1R] [P] [P] [P] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

SEE IOA ANALYSIS #5034. FUNCTIONAL LOSS OF VENTING VIA THE VACUUM VENT LINE ALSO PRECLUDES REPRESSURIZING THE AIRLOCK. HOWEVER, THE DEPRESSURIZATION VALVE LEAKS 0.1 PSI PER SECOND, WHILE BOTH EQUALIZATION VALVES OPEN ON PRESSURE AT A RATE OF 0.5 PSI PER SECOND.

REPORT DATE 03/10/88 C-639
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5034A
NASA FMEA #: 06-1-1128-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5034
ITEM: DEPRESS VALVE/CAP (1 EACH)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ] [ P ] [ P ] [ P ] [ ] *(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5034. FUNCTIONAL LOSS OF VENTING VIA THE VACUUM VENT LINE ALSO PRECLUDES REPRESSURIZING THE AIRLOCK. HOWEVER, THE DEPRESSURIZATION VALVE LEAKS 0.1 PSI PER SECOND, WHILE BOTH EQUALIZATION VALVES OPEN ON PRESSURE AT A RATE OF 0.5 PSI PER SECOND.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88  NASA DATA:  
ASSESSMENT ID: LS-5035 BASELINE [ ]  
NASA FMEA #: 06-1-1603-2 NEW [ X ]

SUBSYSTEM: LIFE SUPPORT  
MDAC ID: 5035  
ITEM: AIRLOCK TO CABIN VENT CAP (2)  

LEAD ANALYST: R.E. DUFFY  

ASSESSMENT:  

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RECOMMENDATIONS: (If different from NASA)  

[ 2 /1R ] [ P ] [ P ] [ P ] [ A ]  
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)  

ADEQUATE [ ]  
INADEQUATE [ ]

REMARKS:  
SEE IOA ANALYSIS #5035. NASA FMEA NOT AVAILABLE. HOWEVER, THERE ARE ONLY TWO EQUALIZATION VALVES, THUS ONLY TWO PIECES OF HARDWARE THAT CAN ALLOW REPRESSURIZATION OF THE AIRLOCK AFTER AN EVA.

REPORT DATE 03/10/88  C-641
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5035A
NASA FMEA #: 06-1-1603-3

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5035
ITEM: AIRLOCK TO CABIN VENT CAP (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /1R ]  [ P ]  [ P ]  [ P ]  [ A ]

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5035. NASA FMEA NOT AVAILABLE. HOWEVER, THERE ARE ONLY TWO EQUALIZATION VALVES, THUS ONLY TWO PIECES OF HARDWARE THAT CAN ALLOW REPRESSURIZATION OF THE AIRLOCK AFTER AN EVA.

REPORT DATE 03/10/88 C-642
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5036
NASA DATA:
BASELINE [ ]
NEW [ x ]

NASA FMEA #: 06-1-1603-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5036
ITEM: AIRLOCK TO CABIN VENT CAP (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ P ] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FUNCTIONAL LOSS IS LOSS OF MISSION SINCE THE VALVE IS AN UNLIKE REDUNDANCY TO THE CAP. HOWEVER THE AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. FOR FURTHER CLARIFICATION SEE ASSESSMENT #LS-5003.

REPORT DATE 03/10/88 C-643
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5037
NASA FMEA #: 06-1-1602-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5037
ITEM: AIRLOCK TO CABIN FILTER (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-644
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5038
NASA FMEA #: 01-1-1602-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5038
ITEM: AIRLOCK TO CABIN FILTER (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FAILURE IS QUESTIONABLE. LOSS OF FILTERATION DOES NOT CAUSES VALVE FAILURE.

REPORT DATE 03/10/88 C-645
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5039
NASA FMEA #: 06-1-1601-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5039
ITEM: AIRLOCK TO CABIN EQUALIZATION VALVE (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

| [ 2 /1R ] | [ P ] | [ NA ] | [ P ] | [ A ] |

(ADD/DELETE)

*CIL RETENTION RATIONALE: (If applicable)*

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REMARKS:
NONE

REPORT DATE 03/10/88 C-646
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5040
NASA FMEA #: 06-1-1601-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5040
ITEM: AIRLOCK TO CABIN EQUALIZATION VALVE (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
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  INADEQUATE [ ]

REMARKS:
WORST CASE SCENARIO HARDWARE LOSS IS VALVE OPEN, CAP DOES NOT MATE. EVA MISSION IS CALLED SHORT/OFF AND FURTHER MISSIONS ARE CANCELLED. THUS FUNCTION LOSS IS LOSS OF EVA MISSION.

REPORT DATE 03/10/88 C-647
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5041
NASA FMEA #: 06-1-1601-4

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5041
ITEM: AIRLOCK TO CABIN EQUALIZATION VALVE (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES NSTS 22206. FOR IOA ANALYSIS SEE THE LIFE SUPPORT ID# 5041.

REPORT DATE 03/10/88 C-648
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5042
NASA FMEA #: 06-1-1604-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5042
ITEM: AIRLOCK TO CABIN PRESSURE DIFFERENTIAL (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-649
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5042A
NASA FMEA #: 06-1-1605-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5042
ITEM: AIRLOCK TO CABIN PRESSURE DIFFERENTIAL (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)
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INADEQUATE [ ]

REMARCHES:

REPORT DATE 03/10/88 C-650
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5043
NASA FMEA #: 06-1-1604-3

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5043
ITEM: AIRLOCK TO CABIN PRESSURE DIFFERENTIAL (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:
WORST CASE SCENARIO HARDWARE LOSS IS VALVE OPEN, CAP DOES NOT MATE. EVA MISSION IS CALLED SHORT/OFF AND FURTHER MISSIONS ARE CANCELLED. THUS FUNCTION LOSS IS LOSS OF EVA MISSION.

REPORT DATE 03/10/88 C-651
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5043A
NASA FMEA #: 06-1-1605-3

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5043
ITEM: AIRLOCK TO CABIN PRESSURE DIFFERENTIAL (2)

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
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REMARKS:
WORST CASE SCENARIO HARDWARE LOSS IS VALVE OPEN, CAP DOES NOT MATE. EVA MISSION IS CALLED SHORT/OFF AND FURTHER MISSIONS ARE CANCELLED. THUS FUNCTION LOSS IS LOSS OF EVA MISSION.

REPORT DATE 03/10/88 C-652
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5044
NASA FMEA #: 06-1-1104-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5044
ITEM: AIRLOCK DIFFERENTIAL PRESSURE SENSOR

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5044A
NASA FMEA #: 06-1-1114-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5044
ITEM: AIRLOCK DIFFERENTIAL PRESSURE SENSOR
LEAD ANALYST: R.E. DUFFY

NASA DATA:
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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

REPORT DATE 03/10/88 C-654
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5045
NASA FMEA #: 06-1-1632-1
NASA DATA: BASELINE [ ] NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5045
ITEM: AIRLOCK WALL TEMPERATURE SENSOR

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-655
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5046
NASA FMEA #: 06-1-1124-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5046
ITEM: AIRLOCK TO AMBIENT VENT CAP (2)

LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5046
ITEM: AIRLOCK TO AMBIENT VENT CAP (2)

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN
EMERGENCY EVA LOSS DUE TO THIS IS NOT CORRECT BECAUSE THE LATTER
IS A SECOND FAILURE WHICH VIOLATES NSTS 22206. FOR IOA ANALYSIS
SEE THE LIFE SUPPORT ID#5041.

REPORT DATE 03/10/88 C-656
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5047  NASA DATA:
NASA FMEA #: 06-1-1124-1  BASELINE [ ]  NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5047
ITEM: AIRLOCK TO AMBIENT VENT CAP (2)

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

REPORT DATE 03/10/88  C-657
## APPENDIX C
### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 3/08/88  
**ASSESSMENT ID:** LS-5048  
**NASA FMEA #:** 06-1-1123-1  
**SUBSYSTEM:** LIFE SUPPORT  
**MDAC ID:** 5048  
**ITEM:** AIRLOCK TO AMBIENT FILTER (2)  
**LEAD ANALYST:** R.E. DUFFY

### ASSESSMENT:

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**RECOMMENDATIONS:**  
(If different from NASA)  
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(ADD/DELETE)

* **CIL RETENTION RATIONALE:**  
(If applicable)  
ADEQUATE [ ]  
INADEQUATE [ ]

**REMARKS:**  
AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES NSTS 22206. FOR IOA ANALYSIS SEE THE LIFE SUPPORT ID# 5041.

---

**REPORT DATE 03/10/88**  
**C-658**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5049
NASA FMEA #: 06-1-1123-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5049
ITEM: AIRLOCK TO AMBIENT FILTER (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5049. FAILURE IS QUESTIONALBE. LOSS OF FILTERATION DOES NOT CAUSE VALVE TO FAIL OPEN.

REPORT DATE 03/10/88 C-659
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5050
NASA FMEA #: 06-1-1122-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5050
ITEM: AIRLOCK TO AMBIENT EQUALIZATION VALVE (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSURING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES NSTS 22206. FOR IOA ANALYSIS SEE THE LIFE SUPPORT ID#5041.

REPORT DATE 03/10/88 C-660
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88          NASA DATA:
ASSESSMENT ID: LS-5051            BASELINE [ ]
NASA FMEA #: 06-1-1122-2          NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5051
ITEM: AIRLOCK TO AMBIENT EQUALIZATION VALVE (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA ANALYSIS #5041 ASSUMED THE TUNNEL ADAPTER WAS ATTACHED.
WITHOUT THIS THE AIRLOCK WOULD LEAK TO SPACE FORCING EVALUATION
BY THE AIRLOCK CREW. THE LEAK CANNOT BE GREATER THAN TWO
EQUALIZATION VALVES WIDE OPEN ON THE CABIN SIDE. EACH VALVE ALSO
HAS A THREATED CAP WHICH IS CAPABLE OF A PRESSURE SEAL. WORST
CASE SCENARIO IS LOSS OF FURTHER MISSIONS.

REPORT DATE 03/10/88 C-661
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5052
NASA FMEA #: 06-1-1122-4

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5052
ITEM: AIRLOCK TO AMBIENT EQUALIZATION VALVE (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

CRITICALITY
FLIGHT
HDW/FUNC

REduNDANCY SCREENS

CIL
ITEM

NASA [ 1 /1 ] [ ] [ ] [ ] [ ] [ X ] *
IOA [ 2 /2 ] [ ] [ ] [ ] [ ] [ X ]
COMPARE [ N /N ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
AIRLOCK IS NOT AN EMERGENCY PIECE OF EQUIPMENT. ASSUMING AN
EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE
LATTER IS A SECOND FAILURE WHICH VIOLATES NSTS 22206. FOR IOA
ANALYSIS SEE THE LIFE SUPPORT ID# 5041.

REPORT DATE 03/10/88 C-662
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5053
NASA FMEA #: 06-1-1120-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5053
ITEM: AIRLOCK TO AMBIENT PRESSURE DIFFERENTIAL (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
CREW INCONVENIENCE. SEE IOA ANALYSIS # 5042.

REPORT DATE 03/10/88 C-663
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5053A
NASA FMEA #: 06-1-1121-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5053
ITEM: AIRLOCK TO AMBIENT PRESSURE DIFFERENTIAL (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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NASA [ 3 /3 ] [ ] [ ] [ ] [ ] [ X ] *

IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

COMPARE [ / ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
CREW INCONVENIENCE. SEE IOA ANALYSIS # 5042.

REPORT DATE 03/10/88 C-664
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5054
NASA FMEA #: 06-1-1120-4

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5054
ITEM: AIRLOCK TO AMBIENT PRESSURE DIFFERENTIAL (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ P ] [ P ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

REPORT DATE 03/10/88 C-665
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5054A
NASA FMEA #: 06-1-1121-4

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5054
ITEM: AIRLOCK TO AMBIENT PRESSURE DIFFERENTIAL (2)

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ P ] [ P ] [ ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

REPORT DATE 03/10/88 C-666
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5055
NASA FMEA #: 05-6UA-2008-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5055
ITEM: EMU POWER/BATTERY CHARGER BUS SELECT SWITCH (2)
LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED. THERE IS NO REDUNDANCY TO EACH OF THE SWITCH/SYSTEMS.

REPORT DATE 03/10/88 C-667
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5055A
NASA FMEA #: 05-6UA-2008-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5055
ITEM: EMU POWER/BATTERY CHARGER BUS SELECT SWITCH (2)
LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ X ]

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED. THERE IS NO REDUNDANCY TO EACH OF THE SWITCH/SYSTEMS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88  NASA DATA:
ASSESSMENT ID:  LS-5056  BASELINE [ ]
NASA FMEA #:  NEW [ ]

SUBSYSTEM:  LIFE SUPPORT
MDAC ID:  5056
ITEM:  EMU POWER/BATTERY CHARGER RPC (4)

LEAD ANALYST:  R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS:  (If different from NASA)

[ 2 /2 ]      [ ] | [ ] | [ ] | [ ] | [ A ]  (ADD/DELETE)

* CIL RETENTION RATIONALE:  (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION.
The NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR
REALLOCATED TO ANOTHER SUBSYSTEM.

REPORT DATE 03/10/88  C-669
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5057
NASA FMEA #: 
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5057
ITEM: EMU POWER/BATTERY Charger DIODE (4)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

|             | [ 3 /2R ] | [ P ] | [ P ] | [ P ] | [ ] |

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

Adequate [ ]

Inadequate [ ]

REMARKS:

There was no NASA ALSS FMEA which matched the IOA description.
The NASA analysis may be combined with some other hardware or reallocated to another subsystem.

REPORT DATE 03/10/88 C-670
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5058
NASA FMEA #: NASA DATA:

NASA DATA: BASELINE [ ]
NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5058
ITEM: EMU POWER/BATTERY CHARGER DIODE (4)

LEAD ANALYST: R.E. DUFFY

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NASA [ / ] [ ] [ ] [ ] [ ] [ ] *

IOA [ 3 /2R ] [ P ] [ P ] [ P ] [ ]

COMPARE [ N /N ] [ N ] [ N ] [ N ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ P ] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION.
THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR
REALLOCATED TO ANOTHER SUBSYSTEM.

REPORT DATE 03/10/88 C-671
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5059
NASA FMEA #: NASA DATA:
NASA DATA: BASELINE [ ]
NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5059
ITEM: EMU POWER/BATTERY CHARGER POWER SUPPLY (2)

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH Matched THE IOA DESCRIPTION.
THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR
REALLOCATED TO ANOTHER SUBSYSTEM.

REPORT DATE 03/10/88 C-672
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5060
NASA FMEA #: NOAA

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5060
ITEM: EMU POWER/BATTERY CHARGER POWER SUPPLY (2)

LEAD ANALYST: R.E. DUFFY

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IOA [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ X ]

COMPARE [ N /N ] [ ] [ ] [ ] [ ] [ N ]

RECOMMENDATIONS: (If different from NASA)

[ ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION.
THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR
REALLOCATED TO ANOTHER SUBSYSTEM.

REPORT DATE 03/10/88 C-673
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5061
NASA FMEA #: NASA DATA:
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5061
ITEM: EMU INPUT SWITCH (1)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

CRITICALITY REDUNDANCY SCREENS CIL
FLIGHT HDW/FUNC A B C ITEM

NASA [ / ] [ ] [ ] [ ] [ ] [ ] *
IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

COMPARE [ N /N ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION.
THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR
REALLOCATED TO ANOTHER SUBSYSTEM.

REPORT DATE 03/10/88 C-674
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5062
NASA FMEA #: NASA DATA:
SUBSYSTEM: LIFE SUPPORT BASELINE [ ]
MDAC ID: 5062 NEW [ ]
ITEM: EMU VOLT/CURRENT INDICATOR
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

CRITICALITY REDUNDANCY SCREENS CIL
FLIGHT HDW/FUNC A B C ITEM

NASA [ ] / [ ] [ ] [ ] [ ] [ ] [ ] *

IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

COMPARE [ N /N ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION.
THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR
REALLOCATED TO ANOTHER SUBSYSTEM.

REPORT DATE 03/10/88 C-675
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5063
NASA FMEA #: NASA DATA:

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5063
ITEM: EMU POWER SUPPLY CURRENT SENSOR
LEAD ANALYST: R.E. DUFFY

NASA DATA:
BASELINE [ ]
NEW [ ]

ASSSESSMENT:
CRITICALITY REDUNDANCY SCREENS CIL
FLIGHT HDW/FUNC A B C ITEM

NASA [ / ] [ ] [ ] [ ] [ ] [ ] *
IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]
COMPARE [ N /N ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION.
THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR
REALLOCATED TO ANOTHER SUBSYSTEM.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5064
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5064
ITEM: EMU POWER SUPPLY VOLTAGE SENSOR

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION.
THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR
REALLOCATED TO ANOTHER SUBSYSTEM.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5065
NASA FMEA #: 06-1-1631-2
NASA DATA:
BASELINE [ ] NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5065
ITEM: VACUUM VENT ISOLATION VALVE (1)

LEAD ANALYST: R.E. DUFFY

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COMPARE [ /N ] [ ] [ ] [ ] [ N ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /2R ] [ P ] [ P ] [ P ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SEE IOA ANALYSIS #5065. IN ADDITION, THE VALVES BUTTERFLY HAS A PURGE HOLE TO PREVENT BUILD-UP OF GASES IN THE DUCT. ASSIGNED CRITICALITY HAS TO RESTRICT ITSELF TO THE CONSEQUENCES OF THE PRESENT FAILURE. WORST CASE SCENARIO SHOWS THAT THE LOSS OF THE FUNCTION TO "VENT" WILL LEAD TO THE INABILITY TO DEPRESSURIZE THE AIRLOCK.

REPORT DATE 03/10/88 C-678
# APPENDIX C
## ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 3/08/88  
**NASA DATA:**  
**ASSESSMENT ID:** LS-5066  
**NASA FMEA #:** 06-1-1631-1

**SUBSYSTEM:** LIFE SUPPORT  
**MDAC ID:** 5066  
**ITEM:** VACUUM VENT ISOLATION VALVE (1)

**LEAD ANALYST:** R.E. DUFFY

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**RECOMMENDATIONS:** (If different from NASA)

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(ADD/DELETE)

**CIL RETENTION RATIONALE:** (If applicable)

ADEQUATE [ ]  
INADEQUATE [ ]

**REMARKS:**

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**REPORT DATE** 03/10/88  
**C-679**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5067
NASA FMEA #: 05-6VC-2026-1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5067
ITEM: VACUUM VENT ISOL. VLV. CNTRL. SWITCH (1)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

IOA COMMENT: THE LOSS OF THE VACUUM VENT ISOLATION VALVE CONTROLS WAS NOT CONSIDERED BY THE IOA TO BE AN IMMEDIATE LOSS OF MISSION, AS IT WAS FOR THE NASA FMEA, BUT A NON-MISSION ESSENTIAL EFFECT FOR THE FIRST FAILURE IN THE IOA ANALYSIS.

REPORT DATE 03/10/88 C-680
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88  
ASSESSMENT ID: LS-5068  
NASA FMEA #: 05-6VC-2026-1

NASA DATA:
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT  
MDAC ID: 5068  
ITEM: VACUUM VENT ISOL. VLV. CNTRL. SWITCH (1)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

IOA COMMENT: THE LOSS OF THE VACUUM VENT ISOLATION VALVE CONTROLS WAS NOT CONSIDERED BY THE IOA TO BE AN IMMEDIATE LOSS OF MISSION, AS IT WAS FOR THE NASA FMEA, BUT A NON-MISSION ESSENTIAL EFFECT FOR THE FIRST FAILURE IN THE IOA ANALYSIS.

REPORT DATE 03/10/88  C-681
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5068A
NASA FMEA #: 05-6VC-2026-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5068
ITEM: VACUUM VENT ISOL. VLV. CNTRL. SWITCH (1)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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IOA [ 3 /2R ] [ P ] [ P ] [ P ] [ ]

COMPARE [ N /N ] [ ] [ ] [ ] [ N ]

RECOMMENDATIONS:
(If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE:
(If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS
AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT
OF THIS ITEM WAS ATTEMPTED.

IOA COMMENT:
THE LOSS OF THE VACUUM VENT ISOLATION VALVE
CONTROLS WAS NOT CONSIDERED BY THE IOA TO BE AN IMMEDIATE LOSS OF
MISSION, AS IT WAS FOR THE NASA FMEA, BUT A NON-MISSION ESSENTIAL
EFFECT FOR THE FIRST FAILURE IN THE IOA ANALYSIS.

REPORT DATE 03/10/88 C-682
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5069
NASA FMEA #: 05-6VC-2027-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5069
ITEM: VACUUM VENT ISOL. VLV. BUS SELECT SWITCH (1)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

IOA COMMENT: THE LOSS OF THE VACUUM VENT ISOLATION VALVE CONTROLS WAS NOT CONSIDERED BY THE IOA TO BE AN IMMEDIATE LOSS OF MISSION, AS IT WAS FOR THE NASA FMEA, BUT A NON-MISSION ESSENTIAL EFFECT FOR THE FIRST FAILURE IN THE IOA ANALYSIS.

REPORT DATE 03/10/88 C-683
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5070
NASA FMEA #: 05-6VC-2027-2

NASA DATA:
BASELINE
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5070
ITEM: VACUUM VENT ISOL. VLV. BUS SELECT SWITCH (1)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 3/1R ] [ P ] [ NA ] [ P ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-684
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5071
NASA FMEA #: 05-6VC-2005-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5071
ITEM: VACUUM VENT ISOL. VLV. CIRCUIT BREAKER (2)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

| 3 /1R | P | NA | P |

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-685
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5072
NASA FMEA #: 05-6VC-2005-2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5072
ITEM: VACUUM VENT ISOL. VLV. CIRCUIT BREAKER (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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| IOA         | [ 3 /2R ] | [ P ] | [ P ] | [ P ] | [ ] |
| COMPARE     | [ /N ]   | [ N ] | [ N ] | [ N ] | [ ] |

RECOMMENDATIONS: (If different from NASA)

[ 3 /1R ]   [ P ]   [ NA]   [ P ]   [ ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

IAA COMMENT: WITH THE LOSS OF THE CIRCUIT BREAKER A CONDITION OF "NO MISSION EFFECT" OCCURS. HOWEVER, IF A SUBSEQUENT FAILURE OCCURS IN THE VACUUM VENT SUBSYSTEM THAN A HAZARDOUS ENVIROMENT OF HYDROGEN COULD BE PRODUCED, CREATING A CRITICALITY OF 3/1R.

DUE TO THE LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88  NASA DATA: 
ASSESSMENT ID: LS-5073  BASELINE [ ] 
NASA FMEA #: 05-6VC-2032-1  NEW [ X ] 

SUBSYSTEM: LIFE SUPPORT 
MDAC ID: 5073 
ITEM: VACUUM VENT ISOL. VLV. CONTROL DIODES (2) 

LEAD ANALYST: R.E. DUFFY 

ASSESSMENT: 

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RECOMMENDATIONS: (If different from NASA) 
[ 3 /3 ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE) 

* CIL RETENTION RATIONALE: (If applicable) 
ADEQUATE [ ] 
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88  C-687
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5073A
NASA FMEA #: 05-6VC-2032-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5073
ITEM: VACUUM VENT ISOL. VLV. CONTROL DIODES (2)

LEAD ANALYST: R.E. DUFFY

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IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ] [ ]
COMPARE [ / ] [ ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)
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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-688
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5074
NASA FMEA #: 05-6VC-2030-1
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5074
ITEM: BUS ISOLATION DIODES (2)
LEAD ANALYST: R.E. DUFFY

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COMPARE: [ ]

RECOMMENDATIONS: (If different from NASA)

CIL RETENTION RATIONALE: (If applicable)

REMARKS:

REPORT DATE 03/10/88 C-689
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5075
NASA FMEA #: 05-6VC-2030-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5075
ITEM: BUS ISOLATION DIODES (2)

LEAD ANALYST: R.E. DUFFY

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-690
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88  
ASSESSMENT ID: LS-5076  
NASA FMEA #:  

NASA DATA:  
BASELINE [ ]  
NEW [ ]  

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RECOMMENDATIONS:  
(If different from NASA)

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* CIL RETENTION RATIONALE:  
(If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION. 
THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR 
REALLOCATED TO ANOTHER SUBSYSTEM.

REPORT DATE 03/10/88  C-691
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5077
NASA FMEA #: 05-6VC-2033-1

NASA DATA:
BASELINE [    ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5077
ITEM: CONTROL VALVE SWITCH INDICATOR (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88    C-692
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5077A
NASA FMEA #: 05-6VC-2033-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5077
ITEM: CONTROL VALVE SWITCH INDICATOR (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-693
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5078
NASA FMEA #: 05-6VC-2033-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5078
ITEM: VACUUM VENT BARBER POLE INDICATOR (1)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-694
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5078A
NASA FMEA #: 05-6VC-2033-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5078
ITEM: VACUUM VENT BARBER POLE INDICATOR (1)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-695
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5079
NASA FMEA #: 05-6VC-2045-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5079
ITEM: ISOL. VALVE SWITCH SENSOR RESISTOR (A8R5 AND A8R6) (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-696
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5080
NASA PMEA #: 05-6VC-2043-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5080
ITEM: BUS SELECT SWITCH SENSOR RESISTORS (A8R1 AND A8R2) (2)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

REPORT DATE 03/10/88 C-697
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5081
NASA FMEA #: 05-6VC-2044-1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5081
ITEM: ISOL. VALVE SENSOR POWER RESISTOR (A8R3 & 4)
LEAD ANALYST: R.E. DUFFY

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| COMPARE     | [ / ]          | [ ] | [ ] | [ ] | [ ] |

RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

THE INTEGRATED SCHEMATIC RESISTOR VALUES ARE IN ERROR. THE VALUE SHOULD BE 1.2K OHM, INSTEAD OF THE 5.1K OHM SHOWN FOR THE SCHEMATIC. DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

REPORT DATE 03/10/88 C-698
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88  NASA DATA:
ASSESSMENT ID: LS-5081A  BASELINE [ ]
NASA FMEA #: 05-6VC-2044-2   NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5081
ITEM: ISOL. VALVE SENSOR POWER RESISTOR (A8R3 & 4)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE INTEGRATED SCHEMATIC RESISTOR VALUES ARE IN ERROR. THE VALUE SHOULD BE 1.2K OHM, INSTEAD OF THE 5.1K OHM SHOWN FOR THE SCHEMATIC. DUE TO LIMITED NASA FMEA DATA (ONLY A CRITICALITY SUMMARY WAS AVAILABLE FOR THE POST 51-L NASA ANALYSIS), NO DETAIL ASSESSMENT OF THIS ITEM WAS ATTEMPTED.

REPORT DATE 03/10/88  C-699
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5082
NASA FMEA #: NASA DATA:

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5082
ITEM: DEDICATED SIGNAL CONDITIONER (83V75A18)
LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION. THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR REALLOCATED TO ANOTHER SUBSYSTEM.

REPORT DATE 03/10/88 C-700
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5083
NASA FMEA #: NASA DATA:

NASA DATA: BASELINE [ ]
NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5083
ITEM: DEDICATED SIGNAL CONDITIONER (83V75A16)

LEAD ANALYST: R.E. DUFFY

ASSESSMENT:

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IOA [ 3 /3 ]
COMPARE [ N /N ]

RECOMMENDATIONS: (If different from NASA)

[ 3 /3 ] [ ] [ ] [ ][ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE WAS NO NASA ALSS FMEA WHICH MATCHED THE IOA DESCRIPTION.
THE NASA ANALYSIS MAY BE COMBINED WITH SOME OTHER HARDWARE OR
REALLOCATED TO ANOTHER SUBSYSTEM.

REPORT DATE 03/10/88 C-701
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5085X
NASA FMEA #: 05-6UA-2012-1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5085
ITEM: EMU WATER SUPPLY STATUS INDICATOR (2)

LEAD ANALYST: R. DUFFY

ASSESSMENT:

CRITICALITY
FLIGHT HDW/FUNC
NASA [ 3 /1R ]  [ P ]  [ NA]  [ P ]  [ ] *
IOA  [ 2 /2 ]  [ ]  [ ]  [ ]  [ X ]

RECOMMENDATIONS: (If different from NASA)
[ 2 /2 ]  [ ]  [ ]  [ ]  [ A ]
(ADD/DELETE)

*CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
(SHORTS TO GROUND)
WITH LINE SHORTED TO GROUND, AS THE SWITCH IS MADE, THE BREAKER
WILL OPEN DUE TO HIGH DEMAND AND THE VALVE WILL NOT ACTUATE. EMU
SUIT CAN NOT BE SERVICED, THUS LOSS OF MISSION. FURTHER
ASSESSMENT CANNOT BE MADE DUE TO LACK OF NASA FMEA DATA.

REPORT DATE 03/10/88  C-702
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5086X
NASA FMEA #: 05-6UA-2013-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5086
ITEM: EMU WASTE WATER STATUS INDICATOR
LEAD ANALYST: R. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[2 /2 ] [ ] [ ] [ ] [ A ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

(SHORTS TO GROUND)

WITH THE LINE SHORTED TO GROUND, AS THE SWITCH IS MADE, THE BREAKER WILL OPEN DUE TO HIGH DEMAND, AND THE VALVE WILL NOT ACTUATE. EMU SUIT CANNOT BE SERVICED, THUS LOSS OF MISSION. FURTHER ASSESSMENT CANNOT BE MADE DUE TO LACK IF NASA FMEA DATA.

REPORT DATE 03/10/88 C-703
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5087X
NASA FMEA #: 06-1-1208-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5087
ITEM: EMU WATER SUPPLY LINES & FITTINGS
LEAD ANALYST: R. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
(RESTRICTED FLOW)
FUNCTIONAL LOSS LEADS TO INABILITY TO SERVICE THE EMU'S. HOWEVER, THE AIRLOCK IS NOT AN EMERGENCY ITEM. ASSUMING AN EMERGENCY EVA LOSS DUE TO THIS FAILURE IS NOT CORRECT BECAUSE THE LATTER IS A SECOND FAILURE WHICH VIOLATES SPECIFICATION NSTS 22206.

REPORT DATE 03/10/88 C-704
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5088X
NASA FMEA #: 06-1-1402-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5088
ITEM: LCG SUPPLY & RETURN, LINES & FITTINGS

LEAD ANALYST: R. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
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*CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
(EXTERNAL LEAK)
LOSS OF MISSION DUE TO INABILITY TO PERFORM FUNCTION. ASSUMING A TWO MAN CREW (BASELINE MISSION), RECOVERY CANNOT BE PERFORMED SINCE EACH SCU CONNECTION HAS NO REDUNDANCY AND SHARING ONE SCU WOULD BE CREW ACTION WHICH IS AGAINST SPEC NSTS 22206. THE AIRLOCK IS NOT AN EMERGENCY ITEM. FOR FURTHER CLARIFICATION SEE ASSESSMENT #5003.

REPORT DATE 03/10/88 C-705
ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5089X
NASA FMEA #: 06-1-1402-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5089
ITEM: LCG SUPPLY & RETURN, LINES & FITTINGS
LEAD ANALYST: R. DUFFY

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
(RESTRICTED FLOW)
LOSS OF MISSION DUE TO INABILITY TO PERFORM FUNCTION. ASSUMING A TWO MAN CREW (BASELINE MISSION), RECOVERY CANNOT BE PERFORMED SINCE EACH SCU CONNECTION HAS NO REDUNDANCY AND SHARING ONE SCU WOULD BE CREW ACTION WHICH IS AGAINST SPEC NSTS 22206. THE AIRLOCK IS NOT AN EMERGENCY ITEM. FOR FURTHER CLARIFICATION SEE ASSESSMENT #5003.

REPORT DATE 03/10/88 C-706
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5090X
NASA FMEA #: 06-1-1209-2
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5090
ITEM: EMU WASTE WATER LINE & FITTINGS
LEAD ANALYST: R. DUFFY

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

(RESTRICTED FLOW)
ASSUMING A TWO MAN CREW, THE FAILURE CAUSES LOSS OF MISSION SINCE THERE IS NO REDUNDANCY FOR EACH CREWMAN.

REPORT DATE 03/10/88 C-707
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5091X
NASA FMEA #: 06-1-1205-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5091
ITEM: 02 QUICK COUPLINGS (NOT USED FOR SCU) AND CAP

LEAD ANALYST: R. DUFFY

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
(INABILITY TO CLOSE, INTERNAL LEAKAGE)
THE HARDWARE ITEMS TO PREVENT LEAKS ARE THE VALVE, COUPLING AND CAP. FUNCTIONALLY THIS FAILURE IS NOT IMPORTANT SINCE BY DEFINITION THIS LEAK IS "INTERNAL". THUS THE CREW IS NOT EVEN AWARE OF THIS FAILURE. THAT IS, BY DEFINITION "INTERNAL LEAK" MEANS NOT ALL THE SEALS CAN FAIL (THIS WOULD BE EXTERNAL LEAKAGE). INABILITY TO CLOSE IS MOOT SINCE THE CAP WOULD NEVER BE TAKEN OFF DURING FLIGHT (CREW USES THE SCU).
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5092X
NASA FMEA #: 06-1-1205-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5092
ITEM: 02 QUICK COUPLING AND CAP (NOT USED FOR SCU)
LEAD ANALYST: R. DUFFY

NASA DATA:
BASELINE 
NEW [ X ]

ASSESSMENT:

CRITICALITY REDUNDANCY SCREENS CIL ITEM
FLIGHT HDW/FUNC A B C

NASA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
IOA [ /NA ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

COMPARE [ N /N ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ /NA ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
(INABILITY TO OPEN)
THIS FAILURE IS MOOT SINCE THE COUPLINGS ARE NEVER USED DURING FLIGHT.

REPORT DATE 03/10/88 C-709
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5093X
NASA FMEA #: 06-1-1127-2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5093
ITEM: CAP VENT DEBRIS SCREEN

LEAD ANALYST: R. DUFFY

ASSESSMENT:

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| IOA [ 3/3 ] | [ ] | [ ] | [ ] | [ ]
| COMPARE [ /N ] | [ N ] | [ N ] | [ N ] | [ ] |

RECOMMENDATIONS: (If different from NASA)

[ 3/3 ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
(DAMAGED ELEMENT, OPEN)
THIS FAILURE IS QUESTIONABLE. LOSS OF FILTERATION DOES NOT CAUSE VALVE FAILURE.

REPORT DATE 03/10/88 C-710
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5094X
NASA FMEA #: 06-1-1124-3

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5094
ITEM: AIRLOCK TO AMBIENT CAP
LEAD ANALYST: R. DUFFY

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RECOMMENDATIONS: (If different from NASA)

[ /NA ] [ ] [ ] [ ] [ ] [ ]

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
(EXTERNAL LEAK)
THIS FAILURE IS NOT REALISTIC SINCE THIS VALVES WOULD NOT BE USED DURING A NORMAL MISSION.

REPORT DATE 03/10/88 C-711
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5095X
NASA FMEA #: 06-1-1631-3
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5095
ITEM: VACUUM VENT ISOLATION VALVE (1)
LEAD ANALYST: R. DUFFY

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

(EXTERNAL LEAK)

THE FAILURE IS QUESTIONABLE. PER NSTS 22206 THE LEAK CANNOT BE THROUGH THE PACKING IN THE VALVES PENETRATION. THE ONLY OTHER PLACES COULD BE THE CASING ITSELF WHICH IS UNREALISTIC OR THE O-RING WHICH SEALS THE VALVE TO THE BULKHEAD. THE O-RING (LACK OF) IS NOT BIG ENOUGH TO DRAIN THE CABIN FASTER THAN CONSUMMABLES FLOW. HOWEVER, ASSUMING CREW INABILITY TO CORRECT THE FAILURE LEADS TO THE ASSIGNMENT OF AN IMMEDIATE LOSS OF MISSION DUE TO AN UNCONTROLLABLE

REPORT DATE 03/10/88 C-712
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5096X
NASA FMEA #: 06-1-1630-1

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5096
ITEM: LINES & FITTINGS, 2 INCH DEPRESSURIZATION

LEAD ANALYST: R. DUFFY

ASSESSMENT:

| CRITICALLY | REDUNDANCY SCREENS | CIL |
| KNIGHT | HDW/FUNC | A | B | C | ITEM |
| NASA | [ 1 /1 ] | [ ] | [ ] | [ ] | [ X ] | * |
| IOA | [ 2 /1R ] | [ P ] | [ P ] | [ P ] | [ X ] |
| COMPARE | [ N /N ] | [ N ] | [ N ] | [ N ] | [ ] |

RECOMMENDATIONS: (If different from NASA)

[ 2 /1R ] [ P ] [ P ] [ P ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADECUTATE [ ]
INADEQUATE [ ]

REMARKS:
(EXTERNAL LEAKAGE)
THE LEAK CAN BE CONTROLLED WITH THE VACUUM VENT ISOLATION VALVE. LOSS OF FUNCTION CREATES A LEAK IN THE CABIN WITH POTENTIAL LOSS OF LIFE/VEHICLE. EVEN THOUGH THE VACUUM ISOLATION VALVE HAS A DRAIN ORIFICE, THERE IS A POTENTIAL BUILD UP OF H2 IF THE LEAK IS DOWNSTREAM OF THE INTERFACE, WHICH ALSO HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE IF H2 IGNITES. THEREFORE, MISSION IS TERMINATED ON FIRST FAILURE.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 3/08/88
ASSESSMENT ID: LS-5097X
NASA FMEA #: 06-1-1630-2

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5097
ITEM: LINES & FITTINGS, 2 INCH DEPRESSURIZATION
LEAD ANALYST: R. DUFFY

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RECOMMENDATIONS: (If different from NASA)
[ /NA ] [ ] [ ] [ ] [ ] [ ]

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
(RESTRICTED FLOW)
NO CRITICALITY HAS BEEN ASSIGNED BECAUSE THIS FAILURE IS NOT CREDIBLE. THE LINE IS 2 INCHES IN DIAMETER AND WOULD REQUIRE LARGE SIZE DEBRIS FOR EFFECTIVE PLUGGING. ON THE OTHER HAND, HYDROGEN IS A VERY LIGHT MOLECULE AND CAN PERMEATE THROUGH ANY SIZE CRACK. IF IOA HAD TO ASSIGN A CRITICALITY, IT WOULD BE A 2/2 (LOSS OF MISSION) SINCE THE AIRLOCK WOULD BE UNABLE TO DEPRESSURIZE.

REPORT DATE 03/10/88 C-714
ASSESSMENT DATE: 3/08/88
NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5098
ITEM: AIRLOCK DEPRESSURIZATION CAP

LEAD ANALYST: K. BARICKMAN

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ 2 /2 ] [ ] [ ] [ ] [ A ]
(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA/NASA FM: INABILITY TO REMOVE.
IOA COMMENT: FUNCTIONAL LOSS IS LOSS OF MISSION AND THERE IS NO REDUNDANCY AVAILABLE.
APPENDIX D

CRITICAL ITEMS
### APPENDIX D

#### POTENTIAL CRITICAL ITEMS

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<thead>
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This appendix contains the IOA analysis worksheets supplementing previous results reported in STSEOS Working Paper 1.0-WP-VA87001-02, Analysis of the LSS and ALSS, (02 November 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, parent assembly and function performed. For each failure mode possible causes are identified, and hardware and functional criticality for each mission phase are determined as described in NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986. Failure mode effects are described at the bottom of each sheet and worst case criticality is identified at the top.

**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
E.1

SUPPLY WATER SUBSYSTEM

ANALYSIS WORKSHEETS
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/28/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 1250

ITEM: FILTER, TANKS N2 INLET (4)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: M.J. SAIDI
SUBSYS LEAD: M.J. SAIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) SUPPLY WATER SUBSYSTEM
3) TANK ASSEMBLY

CRITICALITIES

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LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
CONTINUOUS FLOW OF N2 INTO THE CABIN DISTURBING O2/N2 CONTROL ON THE ARPCS. EVENTUALLY THE CABIN WILL BE N2-RICH, DEPRIVED OF O2, SINCE THE 14.7 PSIA REGULATORS WILL NOT OPEN TO FLOW O2. N2 PRESSURIZATION TO TANKS IS TO BE DISCONTINUED AND TANKS PLACED ON CABIN PRESSURE AS BACK-UP. LOSS OF FUNCTION (LOSS OF TANK PRESSURE) IS LOSS OF EXPELLING WATER THRU DUMP OR FES. LOSS OF THIS FUNCTION (NOT ABLE TO PRESS TANKS) WILL FORCE TERMINATION OF MISSION, SINCE THE PPO2 IN THE CABIN CANNOT BE MAINTAINED AUTOMATICALLY.

REFERENCES:

REPORT DATE 03/10/88 E-3
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

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LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
LOSS OF BACK-UP LINE TO DELIVER FCP WATER TO TANKS. PRIMARY LINE IS AVAILABLE WITH H2 REMOVAL CAPABILITY. LOSS OF FUNCTION TO REMOVE FCP WATER IS POTENTIAL LOSS OF LIFE/VEHICLE.

REFERENCES:

REPORT DATE 03/10/88 E-4
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/28/87  HIGHEST CRITICALITY  HDW/FUNC
SUBSYSTEM: LIFE SUPPORT  FLIGHT: 3/1R
MDAC ID: 1252  ABORT: 3/1R

ITEM: LINES/FITTINGS AND QD, FCP ALTERNATE LINE
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: M.J. SAIIDI  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) SUPPLY WATER SUBSYSTEM
3) TANK ASSEMBLY

CRITICALITIES

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LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
LOSS OF BACK-UP LINE TO DELIVER FCP WATER TO TANKS. PRIMARY LINE IS AVAILABLE WITH H2 REMOVAL CAPABILITY. LOSS OF FUNCTION TO REMOVE FCP WATER IS POTENTIAL LOSS OF LIFE/VEHICLE.

REFERENCES:

REPORT DATE 03/10/88  E-5
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/28/87  HIGHEST CRITICALITY  HDW/FUNC
SUBSYSTEM: LIFE SUPPORT  FLIGHT: 3/2R
MDAC ID: 1253  ABORT: 3/2R

ITEM: LINES/FITTINGS AND QD, FCP ALTERNATE LINE
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: M.J. SAIIDI  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) SUPPLY WATER SUBSYSTEM
3) TANK ASSEMBLY
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LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
LOSS OF ALTERNATE FCP LINE TO FLOW WATER TO THE TANKS. PRIMARY LINE IS AVAILABLE WITH H2 REMOVAL CAPABILITY. LOSS OF FUNCTION TO CARRY WATER TO THE TANKS WITH THIS FAILURE RESULTS IN FLOW OF CONTINUOUS WATER INTO THE AREA, AND LOSS OF WATER REPLENISH THE TANK. MISSION IS LOST, SINCE THE FCPs ARE STILL DRAINED.

REFERENCES:

REPORT DATE 03/10/88  E-6
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/28/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 1254

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

ITEM: LINES/FITTINGS AND QD, FCP ALTERNATE LINE
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: M.J. SAIIDI
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) SUPPLY WATER SUBSYSTEM
3) TANK ASSEMBLY
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CRITICALITIES

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LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
LOSS OF ALTERNATE FCP LINE TO FLOW WATER TO THE TANKS. PRIMARY LINE IS AVAILABLE WITH H2 REMOVAL CAPABILITY. LOSS OF FUNCTION TO CARRY WATER TO THE TANKS WITH THIS FAILURE RESULTS IN FLOW OF CONTINUOUS WATER INTO THE AREA, AND LOSS OF WATER REPLENISH THE TANK. MISSION IS LOST, SINCE THE FCPs ARE STILL DRAINED.

REFERENCES:

REPORT DATE 03/10/88 E-7
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/28/87

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 1255

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

ITEM: LINES AND FITTINGS, H2 VENT
FAILRURE MODE: RESTRICTED FLOW

LEAD ANALYST: M.J. SAIIDI
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) SUPPLY WATER SUBSYSTEM
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CRITICALITIES

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

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
LOSS OF CAPABILITY TO REMOVE H2 FROM THE WATER WILL POSE
POTENTIAL MISSION IMPACT AS EXPLAINED IN MDAC-1100. HOWEVER,
THIS FAILURE ALLOWS WATER TO FLOW TO THE TANKS, SO THAT LOSS OF
FUNCTION WITH THIS FAILURE WILL NOT DEAD-HEAD THE FUEL CELLS.

REFERENCES:

REPORT DATE 03/10/88 E-8
INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/28/87  
SUBSYSTEM: LIFE SUPPORT  
MDAC ID: 1256  

ITEM: LINES AND FITTINGS, A/L TO EMU  
FAILURE MODE: RESTRICTED FLOW  
LEAD ANALYST: M.J. SAIIDI  
SUBSYS LEAD: M.J. SAIIDI  

BREAKDOWN HIERARCHY:  
1) LIFE SUPPORT SYSTEM  
2) SUPPLY WATER SUBSYSTEM  
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CRITICALITIES  

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LOCATION:  
PART NUMBER:  
CAUSES:  
EFFECTS/RATIONALE:  
LOSS OF FUNCTION TO SUPPORT EVA/EMU ACTIVITIES, OTHERWISE NO SIGNIFICANT EFFECT.  
REFERENCES:  

REPORT DATE 03/10/88 E-9
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/28/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 1257

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

ITEM: LINES AND FITTINGS, A/L TO EMU
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: M.J. SAIIDI
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) SUPPLY WATER SUBSYSTEM
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CRITICALITIES

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LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
CONTINUOUS FLOW OF WATER TO THE CABIN UNLESS THE TANKS B OUTLET VALVE IS CLOSED. TANK A OUTLET VALVE AND THE X-OVER VALVE ARE OPERATIONALLY CLOSED. LOSS OF FES A, AND PRIMARY DUMP CAPABILITY. ONLY TWO TANKS REMAINING – MISSION IMPACT.

REFERENCES:

REPORT DATE 03/10/88 E-10
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/12/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 1258

ITEM: SWITCH, OUTLET ISOL VALVE (4)
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: M.J. SAIIDI  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) SUPPLY WATER SUBSYSTEM
3) TANK ASSEMBLY
4) EPDC

CRITICALITIES

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LOCATION: PNL R12A2 - CABIN
PART NUMBER: S4, 10, 15 AND 7

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
THIS FAILURE MODE (PHYSICALLY JAMMED IN CLOSED POSITION) WILL PREVENT OPENING OF THE OUTLET ISOL VALVE TO ALLOW FLOW OF WATER FROM THE AFFECTED TANK - THAT IS LOSS OF ONE TANK FROM WATER MANAGEMENT SCENARIO. FUNCTIONAL LOSS OF REDUNDANT ITEMS WILL HAVE SAME EFFECTS AS MDAC-1112.

REFERENCES:

REPORT DATE 03/10/88 E-11
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/12/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 1259

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

ITEM: SWITCH, OUTLET ISOL VALVE (4)
FAILURE MODE: SHORTED, SINGLE CONTACT

LEAD ANALYST: M.J. SAIIDI
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) SUPPLY WATER SUBSYSTEM
3) TANK ASSEMBLY
4) EPDC
5)
6)
7)
8)
9)

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


LOCATION: PNL R12A2 - CABIN
PART NUMBER: S4, 10, 15 AND 7

CAUSES: CONTAMINATION, CORROSION

EFFECTS/RATIONALE:
A SHORT ACROSS "CLOSE" CONTACTS IS PERCEIVED TO BE MORE SEVERE
THAN ACROSS "OPEN" CONTACTS. IN THIS CASE, THE AFFECTED TANK
WILL BE ISOLATED FROM GENERATED WATER LINE AND THE EFFECT IS SAME
AS EXPLAINED FOR INLET VALVE FAILED CLOSED, MDAC-1112.

REFERENCES:

REPORT DATE 03/10/88 E-12
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/12/88  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3
MDAC ID: 1260 ABORT: 3/3

ITEM: SWITCH, OUTLET ISOL VALVE (4)
FAILURE MODE: OPEN (ELECTRICAL), SINGLE CONTACT

LEAD ANALYST: M.J. SAIIDI  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) SUPPLY WATER SUBSYSTEM
3) TANK ASSEMBLY
4) EPDC
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REDUNDANCY SCREENS: A [ ]  B [ ]  C [ ]

LOCATION: PNL R12A2 - CABIN
PART NUMBER: S4, 10, 15 AND 7

CAUSES: CONTAMINATION, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
A SINGLE CONTACT OPEN ACROSS "OPEN" PINS WILL PREVENT OPENING OF
THE ISOL VALVE THEREFORE ISOLATING THE AFFECTED TANK FROM
GENERATED WATER LINE - SEE MDAC-1112. HOWEVER, THE VALVES ARE
ALL CONFIGURED TO OPEN POSITION THROUGHOUT MISSION, AND NO CREW
ACTION IS ANTICIPATED TO CLOSE THEM.

REFERENCES:

REPORT DATE 03/10/88  E-13
E.2

WASTE MANAGEMENT SUBSYSTEM

ANALYSIS WORKSHEETS
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  HIGHEST CRITICALITY  HDW/FUNC
SUBSYSTEM: LIFE SUPPORT  FLIGHT: 3/2R
MDAC ID: 2225  ABORT: /NA

ITEM: FIXED FILTER URINAL SCREEN (2)
FAILURE MODE: RESTRICTED/BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) URINE/WASTE FLUID COLLECTION ASSEMBLY

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LOCATION: ECLSS AREA 90
PART NUMBER:

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
THE BLOCKAGE IS READILY DETECTABLE AND REQUIRES USE OF ALTERNATE URINE COLLECTION HOSE. IF SECOND PATH FAILS THEN A MISSION LOSS IS A POTENTIAL IF THERE IS NOT SUFFICIENT SUPPLIES OF FCB AND UCD FOR THE REMAINDER OF THE MISSION.

REFERENCES:

REPORT DATE 03/10/88  E-15
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
MDAC ID: 2226
SUBSYSTEM: LIFE SUPPORT
ITEM: EMU QD (1)
FAILURE MODE: RESTRICTED FLOW
LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) URINE/WASTE FLUID COLLECTION ASSEMBLY

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

ITEM: EMU QD (1)
FAILURE MODE: RESTRICTED FLOW
LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) URINE/WASTE FLUID COLLECTION ASSEMBLY

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LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14 [G.E. DWG. 238B5134G1]

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,
FUNGUS/BACTERIAL GROWTH

EFFECTS/RATIONALE:
WITH LOSS OF QD FLOW A "WORK-AROUND" HAS BEEN DEVELOPED AS AN IFM
TO DUMP INTO A CWC, HOWEVER IF THE REDUNDANT PATH FAILS A MISSION
LOSS WOULD BE DEVELOPED.

REFERENCES:

REPORT DATE 03/10/88 E-16
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2227

ITEM: COMMODE LINER
FAILURE MODE: RESTRICTED/BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) FECAL/EMISIS COLLECTION ASSEMBLY

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LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14 [G.E. DWG. 63E905763G2]

CAUSES: OVERLOAD, CHEMICAL REACTION

EFFECTS/RATIONALE:
THE RESTRICTED/BLOCKED FLOW OF THE COMMODE LINER CREATES A MISSION LOSS SCENARIO IF THE FCB AND UCDs ARE NOT SUFFICIENTLY SUPPLIED TO COMPLETE THE MISSION, OTHERWISE THE FCB AND UCDs ARE REDUNDANT COLLECTION METHODS.

REFERENCES:

REPORT DATE 03/10/88 E-17
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2228

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

ITEM: COMMODE LINER
FAILURE MODE: RESTRICTED/BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) FECAL/EMISIS COLLECTION ASSEMBLY
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LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14 [G.E. DWG. 63E905763G2]

CAUSES: OVERLOAD, CHEMICAL REACTION

EFFECTS/RATIONALE:
THE RESTRICTED/BLOCKED FLOW OF THE COMMODE LINER CREATES A MISSION LOSS SCENARIO IF THE FCB AND UCDs ARE NOT SUFFICIENTLY SUPPLIED TO COMPLETE THE MISSION, OTHERWISE THE FCB AND UCDs ARE REDUNDANT COLLECTION METHODS.

REFERENCES:

REPORT DATE 03/10/88 E-18
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2229

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

ITEM: AUXILIARY TRASH VENT ORIFICE (1)
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
THE RESTRICTED/BLOCKED FLOW CAUSES NO PROBLEMS EXCEPT ODOR BUILDUP IN THE AUXILIARY WET TRASH AREA.

REFERENCES:

REPORT DATE 03/10/88 E-19
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2230

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

ITEM: WET TRASH VENT LINE ORIFICE (1)
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION

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

LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
THE RESTRICTED/BLOCKED FLOW OUT OF THE WET TRASH AREA IS OF NO EFFORT TO MISSION OR VEHICLE, EXCEPT POSSIBLE NOXIOUS GAS BUILD-UP IN THE WET TRASH CONTAINER.

REFERENCES:

REPORT DATE 03/10/88 E-20
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2231

ITEM: WET TRASH VENT LINE ORIFICE (1)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: K. BARICKMAN  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
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REDUNDANCY SCREENS:  A [ ]  B [ ]  C [ ]

LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14

CAUSES:

EFFECTS/RATIONALE:
VIEWED AS A NON-CREDIBLE FAILURE - SEE VALVE HOUSING (MDAC ID 2048 AND 2051) FOR EXTERNAL LEAKAGE.

REFERENCES:

REPORT DATE 03/10/88  E-21
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2232

ITEM: WCS CHECK VALVE LINES TO WWS QD
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION

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

LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14

CAUSES: CONTAMINATION, FUNGUS/BACTERIAL GROWTH

EFFECTS/RATIONALE:
THE LOSS OF THIS LINE Restricts THE WCS USAGE AND THUS Restricts WASTE COLLECTION TO PCB AND UCDs WHICH WAS DEFINED AS A MISSION LOSS BECAUSE THERE MAY NOT BE SUFFICIENT SUPPLIES ON-BOARD TO COMPLETE THE MISSION TIME-LINE.

REFERENCES:

REPORT DATE 03/10/88 E-22
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2233

HIGHEST CRITICALITY
HDW/FUNC

FLIGHT: 3/2R
ABORT: /NA

ITEM: WCS CHECK VALVE LINES TO WWS QD
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
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LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14

CAUSES: CONTAMINATION, FUNGUS/BACTERIAL GROWTH

EFFECTS/RATIONALE:
The loss of this line restricts the WCS usage and thus restricts waste collection to FCB and UCDs which was defined as a potential mission loss because there may not be sufficient supplies on-board to complete the mission time-line.

REFERENCES:

REPORT DATE 03/10/88 E-23
**INDEPENDENT ORBITER ASSESSMENT**

**ORBITER SUBSYSTEM ANALYSIS WORKSHEET**

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**ITEM:** COMMODO RE-PRESSURIZATION VALVE ORIFICE (1)

**FAILURE MODE:** RESTRICTED FLOW

**LEAD ANALYST:** K. BARICKMAN

**SUBSYS LEAD:** M.J. SAIDII

**BREAKDOWN HIERARCHY:**

1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) VALVE ASSEMBLY
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**LOCATION:** ECLSS AREA 90

**PART NUMBER:** WCS 80V62A14 (VALVE 5.10) [G.E. DWG 47D264875G4]

**CAUSES:** CONTAMINATION, BACTERIAL/FUNGUS GROWTH

**EFFECTS/RATIONALE:**

WHEN THE ORIFICE IS PLUGGED, THE COMMODOE CANNOT BE REPRESSURIZED AT THE NORMAL RATE, BUT THE COMMODOE CAN STILL BE ACCESSED. IF THE SECONDARY REPRESSURIZATION LINE IS ALSO BLOCKED THEN WCS USAGE FAILS EXCEPT FOR FCB AND UCD WHICH COULD NECESSITATE A MISSION LOSS DUE TO POTENTIAL OF INSUFFICIENT FCB AND UCD SUPPLIES TO COMPLETE THE MISSION.

**REFERENCES:**

REPORT DATE 03/10/88 E-24
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  
SUBSYSTEM: LIFE SUPPORT  
MDAC ID: 2235  

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

ITEM: HOSE ASSEMBLY, FAN/SEPARATOR TO CV (2)  
FAILURE MODE: RESTRICTED FLOW  
LEAD ANALYST: K. BARICKMAN  
SUBSYS LEAD: M.J. SAIIDI  

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) FAN/SEPARATOR
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REDUNDANCY SCREENS:  
A [2]  
B [NA]  
C [P]  

LOCATION: ECLSS AREA 90  
PART NUMBER: WCS 80V62A14  

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, BACTERIAL/FUNGUS GROWTH  

EFFECTS/RATIONALE:  
THE RESTRICTED FLOW CAUSES SWITCHING OVER TO THE BACKUP FAN/SEPARATOR. IF THE SECOND FAN/SEPARATOR FAILS A POTENTIAL LOSS OF MISSION DEVELOPS IF THE FCB AND UCD SUPPLIES ARE NOT SUFFICIENT TO COMPLETE THE MISSION.  

REFERENCES:  

REPORT DATE 03/10/88 E-25
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  HIGHEST CRITICALITY  HDW/FUNC
SUBSYSTEM: LIFE SUPPORT  FLIGHT: 3/2R
MDAC ID: 2236  ABORE: /NA

ITEM: FAN/SEPARATOR MUFFLER HOUSING INLET DUCT
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: K. BARICKMAN  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) FAN/SEPARATOR

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LOCATION: ECLSS AREA 90

PART NUMBER:

CAUSES: CONTAMINATION, OVERLOAD, PIECE-PART FAILURE, VIBRATION, CHEMICAL REACTION, BACTERIAL/FUNGUS GROWTH

EFFECTS/RATIONALE:
LOSS OF FILTERED OUTPUT WILL CAUSE FLOODING OF THE FAN/SEPARATORS AND LOSS OF WCS FUNCTION. THE LOSS OF WCS FUNCTION PRODUCES A LOSS OF MISSION CONDITION IF THE LIMITED FECAL AND URINE COLLECTION DEVICES ARE NOT SUFFICIENT TO COMPLETE THE MISSION.

REFERENCES:

REPORT DATE 03/10/88  E-26
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2237

ITEM: MUFFLER HOUSING ASSEMBLY (1)
FAILURE MODE: RESTRICTED AND BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) FAN/SEPARATOR
6) MUFFLER HOUSING INSTALLATION
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LOCATION: ECLSS AREA 90

CAUSES: CONTAMINATION, PIECE-PART FAILURE, BACTERIAL/FUNGUS GROWTH

EFFECTS/RATIONALE:
THE LOSS OF THE MUFFLER HOUSING FLOW ELIMINATES THE WCS USAGE.
THE REDUNDANT SYSTEM CONSISTS OF THE FCB AND UCDs. IF THERE ARE
NOT SUFFICIENT FCB AND UCD SUPPLIES FOR THE MISSION DURATION THEN
A MISSION LOSS WOULD BE DEVELOPED.

REFERENCES:

REPORT DATE 03/10/88  E-27
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2238

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: /NA

ITEM: MUFFLER HOUSING ASSEMBLY (1)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) FAN/SEPARATOR
6) MUFFLER HOUSING INSTALLATION
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ECLSS AREA 90

CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, PIECE-PART FAILURE, VIBRATION
EFFECTS/RATIONALE:
THE EXTERNAL LEAKAGE OF UNFILTERED WCS CONTROL AIR CREATES A
HEALTH PROBLEM BY THE BACTERIA INVOLVED AND IS A MISSION HAZARD
IF NOT DISCOVERED IN TIME.

REFERENCES:

REPORT DATE 03/10/88 E-28
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2239

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

ITEM: ODOR/BACTERIA FILTER (2)
FAILURE MODE: RESTRICTED/BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) FAN/SEPARATOR
6) MUFFLER HOUSING INSTALLATION
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LOCATION: ECLSS AREA 90
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART FAILURE, HIGH PRESSURE, VIBRATION, BACTERIAL/FUNGUS GROWTH

EFFECTS/RATIONALE:

REFERENCES:

REPORT DATE 03/10/88 E-29
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2240

ITEM: BALLAST VALVE SCREEN (1)
FAILURE MODE: DAMAGED ELEMENT/OPEN

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) BALLAST VALVE
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REduDANCY SCREENS:  A [ ]  B [ ]  C [ ]

LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14 [G.E. DWG 199C3110P2]

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

EFFECTS/RATIONALE:
THIS IS A SECONDARY FILTER SCREEN; THE FAILURE CAUSES NO PROBLEMS.

REFERENCES:

REPORT DATE 03/10/88 E-30
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: LIFE SUPPORT  FLIGHT: 3/3
MDAC ID: 2241  ABORT: /NA

ITEM: BALLAST SELECT VALVE (BALLAST VALVE ASSEMBLY) (1)  
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: K. BARICKMAN  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) BALLAST VALVE

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

LOCATION:  ECLSS AREA 90
PART NUMBER:  WCS 80V62A14 [G.E. DWG 47C265767G2]

CAUSES:  PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:
NO PROBLEM EXCEPT POTENTIAL REDUCED AIR FLOW FROM WET TRASH AREA.

REFERENCES:

REPORT DATE 03/10/88  E-31
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2242

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

ITEM: BALLAST VALVE TO BALLAST CONTROL VALVE LINES AND FITTINGS (1)
FAILURE MODE: RESTRICTED OR BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION

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LOCATION: ECLSS AREA 90
PART NUMBER: G.E. DWG 47C265767G2

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, BACTERIAL/FUNGUS GROWTH

EFFECTS/RATIONALE:
THE LOSS OF THIS LINE PROHIBITS THE STANDARD REPRESSURIZATION OF THE COMMODE OR THE BALLAST AIR FLOW FOR URINAL USAGE, THUS A LOSS OF WASTE COLLECTION METHODS. THE FCB AND UCDs CAN BE USED AS LONG AS THE SUPPLY LASTS, WHICH MAY NOT BE SUFFICIENT TO COMPLETE MISSION.

REFERENCES:

REPORT DATE 03/10/88  E-32
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  HIGHEST CRITICALITY  HDW/FUNC
SUBSYSTEM: LIFE SUPPORT  FLIGHT: 3/3
MDAC ID: 2243  ABORT: /NA

ITEM: BALLAST VALVE TO BALLAST CONTROL VALVE LINES AND FITTINGS (1)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: K. BARICKMAN  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
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REDUNDANCY SCREENS:  A [ ]  B [ ]  C [ ]

LOCATION: ECLSS AREA 90
PART NUMBER: G.E. DWG 47C265767G2

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:
THE EXTERNAL LEAKAGE CAUSES NO PROBLEM FOR MISSION LIFE OR OPERATIONS.

REFERENCES:

REPORT DATE 03/10/88  E-33
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2244

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

ITEM: THIGH BAR RESTRAINT (2)
FAILURE MODE: FAILS CLOSED, FAILS IN "IN-USE" POSITION

LEAD ANALYST: K. BARICKMAN    SUBSYS LEAD: M.J. SAIIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) CREW RERAINT ASSEMBLY
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REDUNDANCY SCREENS:  A [ ]  B [ ]  C [ ]

LOCATION: ECLSS AREA 90
PART NUMBER: G.E. DWG 63E905736G1

CAUSES: MISHANDLING/ABUSE

EFFECTS/RATIONALE:
The thigh bar would fail in the "IN-USE" position if the crew member forced the bar into place, thus bending it out of shape. This failure has occurred on several flights and is remedied by simply bending back into shape. This is an item for potential modifications in design to eliminate the problem.

REFERENCES:

REPORT DATE 03/10/88 E-34
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
HIGHEST CRITICALITY
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2245
FLIGHT: 3/2R
ABORT: /NA

ITEM: WCS BYPASS SWITCH (2)
FAILURE MODE: SHORTED TO GROUND

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) ELECTRICAL PARTS
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LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14 (SWITCH S6 AND S7)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:
THE FAILURE OF THE SWITCH BY SHORTING TO GROUND CAUSES THE ASSOCIATED CIRCUIT BREAKER "TRIP" AND THE OFF-LINE REDUNDANT FAN/SEPARATOR NEEDS TO BE ACTUATED. IF THE SECOND FAN/SEPARATOR FAILS THEN THE FCB AND UCDs MUST BE USED FOR CREW WASTE COLLECTION. IF THERE ARE NOT SUFFICIENT FCB AND UCD SUPPLIES A MISSION LOSS IS DEVELOPED.

REFERENCES:

REPORT DATE 03/10/88 E-35
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2246

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

ITEM: WASTE TANK INLET LINES AND FITTINGS (1)
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE WATER SUBSYSTEM
4) STORAGE ASSEMBLY

CRITICALITIES

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LOCATION: ECLSS AREA 90
PART NUMBER: V62Q0540A

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, BACTERIAL/FUNGUS GROWTH

EFFECTS/RATIONALE:
BLOCKED FLOW ELIMINATES THE WASTE STORAGE TANK USAGE AND ALL WASTE FLUIDS MUST BE DUMPED INTO EITHER A CWC OR DIRECTLY OVERBOARD THRU WASTE OR SUPPLY WATER DUMP LINES.

REFERENCES:

REPORT DATE 03/10/88 E-36
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87

SUBSYSTEM: LIFE SUPPORT

MDAC ID: 2247

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

ITEM: WASTE TANK OUTLET LINES AND FITTINGS

FAILURE MODE: RESTRICTED/BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE WATER SUBSYSTEM

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

LOCATION: ECLSS AREA 90
PART NUMBER: V62Q0540A

CAUSES: CONTAMINATION, FUNGUS/BACTERIA GROWTH

EFFECTS/RATIONALE:
THIS FAILURE ONLY EFFECTS GROUND OPERATIONS AND IS NOT A MISSION IMPACT FAILURE.

REFERENCES:

REPORT DATE 03/10/88 E-37
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2248

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

ITEM: HYDROPHOBIC FILTER (1)
FAILURE MODE: RESTRICTED/BLOCKED FLOW
LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE WATER SUBSYSTEM
4) STORAGE ASSEMBLY
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LOCATION: ECLSS AREA 90
PART NUMBER: 90V62FL1

CAUSES: CONTAMINATION, PIECE-PART FAILURE, CHEMICAL REACTION

EFFECTS/RATIONALE:
LOSS OF THE FILTER IS A DETECTABLE FAILURE BECAUSE THE WASTE TANK
MOTION WILL BE RESTRICTED DUE TO THE EXCESSIVE PRESSURE BUILDUP.
THE WASTE/EMU FLUIDS MUST THEN BE DUMPED OVERBOARD OR INTO A CWC
FOR LATER DISPOSAL. IF ALL COLLECTION/DUMP METHODS
FAILS THEN THE FCB AND UCDs MUST USE. THE FCB AND UCB USAGE
COULD RESULT IN LOSS OF MISSION IF THERE ARE NOT SUFFICIENT
SUPPLIES FOR THE REMAINDER OF THE MISSION.

REFERENCES:

REPORT DATE 03/10/88  E-38
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2249

HIGHEST CRITICALITY
FLIGHT: 3/2R
ABORT: 3/3

ITEM: CONTINGENCY CROSS-TIE QD AND PLUG (1)
FAILURE MODE: INTERNAL LEAKAGE

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE WATER SUBSYSTEM
4) DUMP LINE ASSEMBLY
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LOCATION: ECLSS AREA 90
PART NUMBER: 80V62TP103 (MC276-0020-1101)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, CHEMICAL REACTION

EFFECTS/RATIONALE:
WHEN THE QD LEAKS, THAT IS A "NO EFFECT" FAILURE THAT IS NOT DETECTABLE HOWEVER WHEN THE SEAL ON THE PLUG FAILS THEN BODY WASTES CAN LEAK INTO THE CREW CABIN THUS PRESENTING A HAZARD TO THE CREW AND LOSS OF MISSION SCENARIO. NEITHER OF THESE FAILURES IS DETECTABLE UNTIL THE SECOND ONE OCCURS.

REFERENCES:

REPORT DATE 03/10/88 E-39
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2250

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

ITEM: CONTINGENCY CROSS-TIE QD AND PLUG (1)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE WATER SUBSYSTEM
4) DUMP LINE ASSEMBLY

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LOCATION: ECLSS AREA 90
PART NUMBER: 80V62TP103 (MC276-0020-1101)

CAUSES: PIECE-PART FAILURE, PRESSURE HIGH, VIBRATION, CHEMICAL REACTION

EFFECTS/RATIONALE:
THE FIRST FAILURE LIMITS MISSION LIFE BECAUSE OF LOST WASTE COLLECTION METHODS AND MUST USE FCB AND UCDs. THE EXTERNAL LEAKAGE OF THE QD MEANS THAT IF THE CROSS-TIE NEEDS TO BE USED FOR THE SUPPLY WATER DUMP THEN THERE IS A POTENTIAL FOR LOSS OF COOLING FLUIDS AND THUS LOSS OF LIFE/VEHICLE IF UNDETECTED.

REFERENCES:

REPORT DATE 03/10/88 E-40
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: LIFE SUPPORT  FLIGHT: 3/3
MDAC ID: 2251  ABORT: /NA

ITEM: WASTE DUMP VALVE SWITCH INDICATOR (1)
FAILURE MODE: FAILS OPEN

LEAD ANALYST: K. BARICKMAN  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE WATER SUBSYSTEM
4) ELECTRICAL PARTS
5) DUMP LINE ASSEMBLY

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

LOCATION: D&C PANEL ML31C, 80V73A127
PART NUMBER: INDICATOR DS4

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:
THE FAILURE OF THE INDICATOR IS NOT MISSION OR LIFE CRITICAL AS THERE ARE OTHER INDICATIONS OF VALVE STATUS AND EVEN IF ALL VALVE STATUS IS LOST WASTE DUMPS CAN STILL BE PERFORMED IF THE VALVE FUNCTION IS NOT LOST.

REFERENCES:

REPORT DATE 03/10/88  E-41
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2252

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

ITEM: WASTE DUMP VALVE SWITCH
FAILURE MODE: FAILS SHORTED, SHORT TO GROUND

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE WATER SUBSYSTEM
4) ELECTRICAL PARTS
5) DUMP LINE ASSEMBLY

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LOCATION: D&C PANEL ML31C, 80V73A127
PART NUMBER: INDICATOR DS4

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:
LOSS OF INDICATOR BY GROUNDING WILL ELIMINATE THE WASTE WATER DUMP VALVE CAPABILITY BECAUSE OF TRIPPED CIRCUIT BREAKER AND THE SUPPLY WATER DUMP LINE MUST BE USED. UNLESS THE VALVE IS OPEN AT TIME OF FAILURE, IN WHICH CASE THERE IS POTENTIAL FOR LOSS OF LIFE IF ANOTHER VALVE SEAL FAILS (2/1R PNP CRITICALITY). IF THE SUPPLY WATER DUMP BECOMES INOPERABLE THE FUEL CELLS COULD BE FLOODED, HENCE LOSS OF ORBITER POWER AND A LOSS OF LIFE CONDITION ARISES.

REFERENCES:

REPORT DATE 03/10/88 E-42
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  HIGHEST CRITICALITY
SUBSYSTEM: LIFE SUPPORT  HDW/FUNC: FLIGHT: 3/2R
MDAC ID: 2253  ABORT: /NA

ITEM: FAN/SEPARATOR INLET HOSE FROM COMMODE (2)  FAILURE MODE: RESTRICTED AND BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) FAN/SEPARATOR

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LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:

REFERENCES:

REPORT DATE 03/10/88  E-43
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2254

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

ITEM: SCREEN, DOWNSTREAM OF BALLAST/REPRESS SCREEN (1)
FAILURE MODE: RESTRICTED/BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE COLLECTION SUBSYSTEM
4) LIQUID AND AIR LINE INSTALLATION
5) BALLAST VALVE

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LOCATION: ECLSS AREA 90
PART NUMBER: WCS 90V62A14 [G.E. DWG 47D232872P3]

CAUSES: CONTAMINATION, BACTERIA/FUNGUS GROWTH

EFFECTS/RATIONALE:
INSUFFICIENT AIRFLOW TO URINAL, EXCESSIVE DRAG ON FAN/SEPARATOR
AND POTENTIAL FOR FLOODING FAN/SEPARATOR. IF FLOW IS BLOCKED,
CANNOT USE URINAL OR COMMODE AND MUST USE FCB AND UCDs. IF FCB
AND UCD SUPPLY IS NOT SUFFICIENT FOR REMAINING MISSION LIFE,
THEN A MISSION LOSS OCCURS.

REFERENCES:

REPORT DATE 03/10/88 E-44
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2255

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

ITEM: LINES AND FITTINGS, DUMP VALVE TO NOZZLE (1)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE WATER SUBSYSTEM
4) DUMP LINE ASSEMBLY
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LOCATION: MIDBODY AREA 40
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:
THE EXTERNAL LEAK IN THE DUMP LINE IS A PROBLEM BECAUSE OF THE POTENTIAL FOR CONTAMINATION OF PAYLOADS DUE TO THE WASTE FLUIDS.

REFERENCES:

REPORT DATE 03/10/88 E-45
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 2256

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

ITEM: LINES AND FITTINGS, DUMP VALVE TO NOZZLE (1)
FAILURE MODE: RESTRICTED/BLOCKED FLOW

LEAD ANALYST: K. BARICKMAN
SUBSYS LEAD: M.J. SAIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) WASTE MANAGEMENT SUBSYSTEM
3) WASTE WATER SUBSYSTEM
4) DUMP LINE ASSEMBLY

CRITICALITIES

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LOCATION: MIDBODY AREA 40
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THE LOSS OF THE EXTERNAL DUMP LINE FORCES THE USE OF THE
CONTINGENCY CROSS-TIE QD AND SUPPLY WATER DUMP LINE. THE USE OF
THE SUPPLY DUMP LINE WITH WASTE FLUIDS COULD PRODUCE A LOST
MISSION IF ALL OF THE DUMP LINES ARE BLOCKED, IN WHICH CASE A
LOSS OF MISSION WOULD BE GENERATED.

REFERENCES:

REPORT DATE 03/10/88 E-46
E.3

SMOKE DETECTION/FIRE SUPPRESSION SUBSYSTEM

ANALYSIS WORKSHEETS

REPORT DATE 03/10/88

E-47
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/06/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3112

HIGHEST CRITICALITY
FLIGHT: 1/1
ABORT: 1/1

ITEM: SWITCH-SMOKE DETECTOR SENSOR RESET (57)
FAILURE MODE: SHORTED, SHORTS (POLE-TO-POLE), SHORTS (TO GROUND)

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) SMOKE DETECTION
3) RESET
4) SWITCH
5)
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CRITICALITIES
FLIGHT PHASE         HDW/FUNC ABORT   HDW/FUNC
PRELAUNCH:           1/1       RTLS:     1/1
LIFTOFF:             1/1       TAL:      1/1
ONORBIT:             1/1       AOA:      1/1
DEORBIT:             1/1       ATO:      1/1
LANDING/SAFING:      1/1

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

LOCATION: PNL L1A1
PART NUMBER: 31V73A1A1

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

EFFECTS/RATIONALE:
The failure ties two or three main buses together which may result in the loss of two or four smoke detectors. If the failure ties three buses one bay will have no sensing remaining, if two buses are tied one subsequent failure can result in the same condition.

REFERENCES:

REPORT DATE 03/10/88  E-48
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/06/88
MDAC ID: 3114

ITEM: SW-SMOKE DETECTOR CIRCUIT TEST (S8)
FAILURE MODE: SHORTED, SHORTED (POLE-TO-POLE), SHORT (TO GROUND)

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) SMOKE DETECTION
3) SWITCH
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LOCATION: PNL L1A1
PART NUMBER: 31V73A1A1

CAUSES:

EFFECTS/RATIONALE:
The smoke detector status alarms are continuously configured in
the test mode which disables the hardware alarm. Redundant smoke
concentration FDA alearms remain in all areas.

REFERENCES:

REPORT DATE 03/10/88 E-49
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/09/88

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3144

ITEM: SWITCH-FIRE SUPPRESSION AV BAY 1, 2, 3, ARM/SAFE
(S1,S2,S3)
FAILURE MODE: INADVERTENT OPERATION, PREMATURE OPERATION, FAILS CLOSED

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) FIRE SUPPRESSION
3) SWITCH
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LOCATION: PNL L1A1
PART NUMBER: 31V73A1A1

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

EFFECTS/RATIONALE:
FAILURE OF COMPONENT RESULTS IN FIRE SUPPRESSANT PIC BEING ARMED. POWER CAN BE REMOVED BY OPENING ASSOCIATED CB. IF BREAKER FAILS CLOSED, PIC CANNOT BE DISARMED. A SUBSEQUENT FAILURE OF DISCHARGE SW OR PIC CAN DISCHARGE SUPPRESSANT & AFTER APPROXIMATELY 50 HRS THE CAPABILITY TO SUPPRESS A FIRE DURING ENTRY IS LOST (PORTABLE BOTTLES CANNOT BE USED DURING THIS PHASE). IF BOTTLE IS DISCHARGED BEFORE LIFT-OFF TERMINATE MISSION, IF LIFT-OFF TAKES PLACE, SUPPRESSANT SHOULD PROVIDE PROTECTION UNTIL ORBIT OPERATIONS ARE ESTABLISHED. FOR DEORBIT A PORTABLE BOTTLE SHOULD BE DISCHARGED INTO AFFECTED BAY PRIOR TO DEORBIT BURN. THIS PROVIDES PROTECTION FOR APPROXIMATELY 24 HOURS. FAILURE IS DETECTABLE THRU PIC CAPACITOR VOLTAGE MEASUREMENTS.

REFERENCES:

REPORT DATE 03/10/88 E-50
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/06/88
MDAC ID: 3148

SUBSYSTEM: LIFE SUPPORT

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

ITEM: SW-FIRE SUPPRESSION AV BAY 1, 2, 3 AGENT DISCH
FAILURE MODE: INADVERTENT OPERATION, PREMATURE OPERATION,
ERRONEOUS OUTPUT, FAILS CLOSED

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) FIRE SUPPRESSION
3) SWITCH
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LOCATION: PNL L1A1
PART NUMBER: 31V73A1A1

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

EFFECTS/RATIONALE:
THE FAILURE ENABLES THE FIRE SUPPRESSANT CONTAINER "FIRE"
COMMAND TO THE ASSOCIATED PIC. THIS FAILURE COUPLED WITH A
FAILURE OF THE ONE SECOND TIMED DELAY WILL INHIBIT THE DISCHARGE
CAPABILITY OF THE CONTAINER. THE PORTABLE BOTTLES PROVIDE
FURTHER PROTECTION ON ORBIT AND ON THE GROUND THUS THE
CRITICALITY BECOMES 3/1R.

REFERENCES:

REPORT DATE 03/10/88 E-51
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/09/88

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

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3154

ITEM: DIODE-NO IDENTIFIER
FAILURE MODE: SHORTED

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) FIRE SUPPRESSION
3) GROUND CIRCUIT
4) FIRE CIRCUIT
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LOCATION:
PART NUMBER:

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
THE FAILURE TIES THE FLIGHT FIRE SUPPRESSANT CONTAINER ARM CIRCUIT TO THE PRE-FLIGHT BUS THROUGH THE TYPE III HYBRID DRIVER. DURING LIFT-OFF AND DEORBIT, IF SUBSEQUENT FAILURES OCCUR WHICH ENABLE LOADS SUFFICIENT TO TRIP THE ASSOCIATED CIRCUIT BREAKER THE PIC CANNOT BE ARMED. ALSO, ONE OTHER FAILURE WITH IN THE DRIVER (SHORTED DIODE) CAN TIE THE CIRCUIT BREAKER TO GROUND. IN ALL OTHER MISSION PHASES THE PORTABLE BOTTLES PROVIDE A BACKUP.

REFERENCES:

REPORT DATE 03/10/88 E-52
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3158
HIGHEST CRITICALITY HDW/FUNC:
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: SMOKE DETECTOR (9)
FAILURE MODE: INADVERTENT OPERATION, PREMATURE OPERATION

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) SMOKE DETECTION
3) DETECTOR
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LOCATION:
PART NUMBER:

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

EFFECTS/RATIONALE:
PROVIDES AN ERRONEOUS FIRE OUTPUT. FAILURE TO OUTPUT OR THIS SAME FAILURE OF THE REDUNDANT SENSOR COULD RESULT IN LOSS OF CREW/VEHICLE. IF A FIRE SUPPRESSANT CONTAINER IS DISCHARGED INTO THE BAY, APPROXIMATELY 50 HOURS OF FIRE PROTECTION REMAINS.

REFERENCES:

REPORT DATE 03/10/88 E-53
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/08/88

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3163

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

ITEM: HYBRID DRIVER (TYPE III) (3)
FAILURE MODE: INTERMITTENT OPERATION, SHORTED

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) FIRE SUPPRESSION
3) GROUND CIRCUIT
4) ARM COMMAND
5) HYBRID DRIVER (TYPE III)
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LOCATION: FWD LCA NO. 1, 2, 3
PART NUMBER: 81V76A16, 17, 18

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

EFFECTS/RATIONALE:
THE FAILURE IS ONLY A PROBLEM IF THE PREFLIGHT BUS IS POWERED.

REFERENCES:

REPORT DATE 03/10/88 E-54
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/08/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3164

ITEM: HYBRID DRIVER (TYPE I) (3)
FAILURE MODE: INADVERTENT OPERATION, SHORTED

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) FIRE SUPPRESSION
3) GROUND CIRCUIT
4) FIRE COMMAND
5) HYBRID DRIVER (TYPE I)
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LOCATION: FWD LCA NO. 1, 2, 3
PART NUMBER: 81V76A16, 17, 18

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

EFFECTS/RATIONALE:
PRELAUNCH THE FAILURE PRECLUDES CHARGE UP OF THE FIRE SUPPRESSANT PIC SINCE A ONE SECOND TIMEDELAY CANNOT BE ACHIEVED. THEREFORE SUPPRESSANT CANNOT BE DISCHARGED INTO THE ASSOCIATED AVIONICS BAY. PORTABLE BOTTLES ARE AVAILABLE AS A BACKUP.

REFERENCES:
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/07/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3165

ITEM: HYBRID DRIVER (TYPE II) (3)
FAILURE MODE: INADVERTENT OPERATION, SHORTED

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) FIRE SUPPRESSION
3) FLIGHT CIRCUIT
4) FIRE COMMAND
5) HYBRID DRIVER (TYPE II)
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FWD LCA NO. 1, 2, 3
PART NUMBER: 81V76A16, 17, 18

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:
The failure precludes charge up of the fire suppressant PIC since the one second time delay is bypassed. Therefore, suppressant cannot be discharged into the associated avionics bay during lift off or deorbit and the portable fire extinguishers are inaccessible at these times.

REFERENCES:

REPORT DATE 03/10/88 E-56
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/07/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3166

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

ITEM: HYBRID DRIVER (TYPE I) - SMOKE DETECTOR GROUND
RESET
FAILURE MODE: INADVERTENT OPERATION, SHORTED

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) FIRE SUPPRESSION
3) GROUND CIRCUIT
4) RESET CIRCUIT
5) HYBRID DRIVER (TYPE I)

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LOCATION: FWD LCA NO. 1, 2, 3
PART NUMBER: 81V76A16, 17, 18

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

EFFECTS/RATIONALE:
THE FAILURE ISSUES A CONTINUOUS RESET TO ALL SMOKE DETECTORS
DISABLING THE STATUS INDICATION FOR THE HARDWARE ALARMS. THE
CONCENTRATION FDA ALARMS FOR ALL SENSORS ARE UNEFFECTED.
POSSIBLE LOSS OF CREW/VEHICLE WITH LOSS OF ALL REDUNDANCY. THE
FAILURE CAN ONLY EXIST WHEN THE PRE-FLIGHT TEST BUS IS POWERED.

REFERENCES:

REPORT DATE 03/10/88 E-57
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/07/88

SUBSYSTEM: LIFE SUPPORT

MDAC ID: 3167

ITEM: HYBRID DRIVER (TYPE I) - SMOKE DETECTOR GROUND

RESET

FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) FIRE SUPPRESSION
3) GROUND CIRCUIT
4) RESET CIRCUIT
5) HYBRID DRIVER (TYPE I)
6)
7)
8)
9)

CRITICALITIES

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

LOCATION: FWD LCA NO. 1, 2, 3
PART NUMBER: 81V76A16, 17, 18

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:
SMOKE DETECTORS CANNOT BE RESET BY PRE-FLIGHT TEST BUS CIRCUIT.
RESET CAN BE PERFORMED USING THE IN FLIGHT CIRCUIT DURING
PRELAUNCH. DURING THE OTHER PHASES THE CIRCUIT IS INACTIVE BY
DESIGN.

REFERENCES:

REPORT DATE 03/10/88 E-58
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88  HIGHEST CRITICALITY    HDW/FUNC
SUBSYSTEM: LIFE SUPPORT  FLIGHT:  3/1R
MDAC ID: 3168  ABORT:  3/1R

ITEM: NASA STANDARD INITIATOR
FAILURE MODE: INADVERTENT OPERATION, PREMATURE OPERATION

LEAD ANALYST: J.D. ARBET  SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) FIRE SUPPRESSION
3) SUPPRESSANT CONTAINER
4) NSI
5)       
6)       
7)       
8)       
9)       

CRITICALITIES

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LOCATION:
PART NUMBER:

CAUSES: CONTAMINATION, ELECTROMAGNETIC FIELDS, CHEMICAL REACTION

EFFECTS/RATIONALE:
LOSS OF FIRE SUPPRESSANT WITHIN THE ASSOCIATED AVIONICS BAY. AFTER RELEASE, THE BAY IS PROTECTED FOR UP TO 50 HOURS. PRELAUNCH THE LAUNCH TOWER EQUIPMENT PROVIDES ONE MORE LEVEL OF SAFETY. FOR LIFTOFF THE RELEASE IS A FAIL SAFE CONDITION. FOR DEORBIT, IF THE CONTAINER HAS BEEN RELEASED, ONE OF THE PORTABLE BOTTLE CAN BE INJECTED INTO THE AFFECTED BAY AND THIS PROVIDES APPROXIMATELY 24 HOURS PROTECTION.

REFERENCES:

REPORT DATE 03/10/88 E-59
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3258

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

ITEM: SMOKE DETECTOR (9)
FAILURE MODE: PARTIAL OUTPUT, LOSS OF CONCENTRATION OUTPUT

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) SMOKE DETECTION
3) DETECTOR
4) 
5) 
6) 
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LOCATION:
PART NUMBER:
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
LOSS OF ONE OF FOUR ALARM SOURCES. THE FIRE STATUS OUTPUT OF THIS SENSOR PLUS THE FIRE STATUS & CONCENTRATION OUTPUTS OF THE REDUNDANT SENSOR ARE STILL AVAILABLE TO ANNUNCIATE A FIRE.

REFERENCES:

REPORT DATE 03/10/88 E-60
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/15/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 3268

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

ITEM: NASA STANDARD INITIATOR
FAILURE MODE: FAILS TO FIRE

LEAD ANALYST: J.D. ARBET
SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) FIRE SUPPRESSION
3) SUPPRESSANT CONTAINER
4) NSI
5)
6)
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
LOSS OF CAPABILITY TO SUPPRESS AN AV BAY FIRE DURING LIFTOFF, INCLUDING ABORTS, AND DEORBIT. PORTABLE BOTTLES AVAILABLE IN OTHER PHASES PLUS LAUNCH TOWER SYSTEMS ARE AVAILABLE PRELAUNCH.

REFERENCES:

REPORT DATE 03/10/88 E-61
E.4

AIRLOCK SUPPORT SYSTEM

ANALYSIS WORKSHEETS

REPORT DATE 03/10/88   E-62
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5085

ITEM: EMU WATER SUPPLY STATUS INDICATOR (2)
FAILURE MODE: SHORT TO GROUND
LEAD ANALYST: R. DUFFY
SUBSYS LEAD: M. SAIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) WATER SYSTEM
4) SUPPLY VALVE
5) STATUS INDICATOR (DS1, DS3)
6)
7)
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9)

CRITICALITIES

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

LOCATION:
PART NUMBER:
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION
EFFECTS/RATIONALE:
WITH LINE SHORTED TO GROUND, AS THE SWITCH IS MADE, THE BREAKER WILL OPEN DUE TO HIGH DEMAND AND THE VALVE WILL NOT ACTUATE. EMU SUIT CAN NOT BE SERVICED, THUS LOSS OF MISSION.

REFERENCES:

REPORT DATE 03/10/88 E-63
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5086

ITEM: EMU WASTE WATER STATUS INDICATOR
FAILURE MODE: SHORTS TO GROUND

LEAD ANALYST: R. DUFFY
SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) WATER SYSTEM
4) WASTE VALVE
5) INDICATOR STATUS (DS2, DS4)
6)
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CRITICALITIES

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

LOCATION:
PART NUMBER:

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

EFFECTS/RATIONALE:
WITH THE LINE SHORTED TO GROUND, AS THE SWITCH IS MADE, THE BREAKER WILL OPEN DUE TO HIGH DEMAND, AND THE VALVE WILL NOT ACTUATE. EMU SUIT CAN NOT BE SERVICED, THUS LOSS OF MISSION.

REFERENCES:

REPORT DATE 03/10/88 E-64
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5087

ITEM: EMU WATER SUPPLY LINES & FITTINGS
FAILURE MODE: RESTRICTED FLOW
LEAD ANALYST: R. DUFFY  SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) WATER SYSTEM
4) (Blank)
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REDUNDANCY SCREENS: A [ ]  B [ ]  C [ ]

LOCATION:

PART NUMBER:

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

EFFECTS/RATIONALE:
LOSS OF MISSION DUE TO INABILITY TO SERVICE THE EMU'S. TWO CREWMEN ARE ASSUMED TO BE SUITED (BASELINE) AND NEITHER HAS A SPARE SCU.

REFERENCES:

REPORT DATE 03/10/88  E-65
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5088

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

ITEM: LCG SUPPLY & RETURN, LINES & FITTINGS
FAILURE MODE: EXTERNAL LEAK

LEAD ANALYST: R. DUFFY  SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) WATER SYSTEM
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REDUNDANCY SCREENS:  A [ ]  B [ ]  C [ ]

LOCATION:
PART NUMBER:

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

EFFECTS/RATIONALE:
LOSS OF MISSION DUE TO INABILITY TO PERFORM FUNCTION. ASSUMING A TWO MAN CREW (BASELINE MISSION), RECOVERY CAN NOT BE PERFORMED SINCE EACH SCU CONNECTION HAS NO REDUNDANCY AND SHUTTING ONE SCU WOULD BE CREW ACTION WHICH IS AGAINST SPEC. NSTS 22206.

REFERENCES:

REPORT DATE 03/10/88  E-66
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5089

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

ITEM: LCG SUPPLY & RETURN, LINES & FITTINGS
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: R. DUFFY
SUBSYS LEAD: M. SAIIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) WATER SYSTEM
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REDUNDANCY SCREENS: A [ ]  B [ ]  C [ ]

LOCATION:
PART NUMBER:

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF MISSION DUE TO INABILITY TO PERFORM FUNCTION. ASSUMING A TWO MAN CREW (BASELINE MISSION), RECOVERY CAN NOT BE PERFORMED SINCE EACH SCU CONNECTION HAS NO REDUNDANCY AND SHUTTING ONE SCU WOULD BE CREW ACTION WHICH IS AGAINST SPEC. NSTS 22206.

REFERENCES:

REPORT DATE 03/10/88 E-67
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5090

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

ITEM: EMU WASTE WATER LINE & FITTINGS
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: R. DUFFY
SUBSYS LEAD: M. SAIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) WATER SYSTEM
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CRITICALITIES
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC
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LILOFF: 3/3 TAL: 3/3
ONORBIT: 2/2 AOA: 3/3
DEORBIT: 3/3 ATO: 3/3
LANDING/SAFING: 3/3

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

LOCATION:
PART NUMBER:

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF MISSION DUE TO INABILITY TO SERVICE THE EMU'S. A TWO MAN CREW (BASELINE MISSION) IS ASSUMED TO BE SUITED AND NEITHER HAS A SPARE SCU.

REFERENCES:

REPORT DATE 03/10/88 E-68
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88  HIGHEST CRITICALITY  HDW/FUNC
SUBSYSTEM: LIFE SUPPORT  FLIGHT: 3/3
MDAC ID: 5091  ABORT: 3/3

ITEM: 02 QUICK COUPLINGS (NOT USED FOR SCU) AND CAP
FAILURE MODE: INABILITY TO CLOSE, INTERNAL LEAKAGE

LEAD ANALYST: R. DUFFY  SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) OXYGEN
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REDUNDANCY SCREENS:  A [ ]  B [ ]  C [ ]

LOCATION:
PART NUMBER:

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

EFFECTS/RATIONALE:
THE COUPLINGS ARE NOT USED ANY TIME DURING THE MISSION. THERE ARE HARDWARE ITEMS TO PREVENT LEAKS ON THIS VALVE, COUPLING AND CAP. FUNCTIONALLY THIS FAILURE IS NOT IMPORTANT SINCE BY DEFINITION THIS LEAK IS "INTERNAL". THUS THE CREW IS NOT EVEN AWARE OF THE FAILURE, I.E.: BY DEFINITION "INTERNAL LEAK" MEANS NOT ALL THE SEALS CAN FAIL (THIS WOULD BE EXTERNAL LEAKAGE). INABILITY TO CLOSE IS MOOT SINCE THE CAP WOULD NEVER BE TAKEN OFF DURING FLIGHT (CREW USES THE SCU).

REFERENCES:

REPORT DATE 03/10/88  E-69
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5092

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

ITEM: 02 QUICK COUPLING AND CAP (NOT USED FOR SCU)
FAILURE MODE: INABILITY TO OPEN

LEAD ANALYST: R. DUFFY
SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) OXYGEN
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
THIS FAILURE IS MOOT SINCE THE COUPLINGS ARE NEVER USED DURING FLIGHT.

REFERENCES:

REPORT DATE 03/10/88 E-70
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
MDAC ID: 5093
SUBSYSTEM: LIFE SUPPORT

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

ITEM: CAP VENT DEBRIS SCREEN
FAILURE MODE: DAMAGED ELEMENT, OPEN

LEAD ANALYST: R. DUFFY
SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) DEPRESS SYSTEM
4)
5)
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:
PART NUMBER:

CAUSES: CONTAMINATION, CHEMICAL REACTION, PIECE-PART FAILURE,
MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
THIS FAILURE MODE IS QUESTIONABLE. HOWEVER, NO MISSION IMPACT.

REFERENCES:

REPORT DATE 03/10/88 E-71
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5094

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

ITEM: AIRLOCK TO AMBIENT CAP
FAILURE MODE: EXTERNAL LEAK

LEAD ANALYST: R. DUFFY
SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:
PART NUMBER:
CAUSES:
EFFECTS/RATIONALE:
FAILURE IS NOT REALISTIC SINCE THE CAP NOMINALLY WOULD NOT BE REMOVED DURING MISSION.

REFERENCES:

REPORT DATE 03/10/88 E-72
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88

SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5095

ITEM: VACUUM VENT ISOLATION VALVE (1)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: R. DUFFY
SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) VACUUM VENT ISOLATION VALVE
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REDUNDANCY SCREENS: A [ ]  B [ ]  C [ ]

LOCATION:
PART NUMBER:

CAUSES: PIECE-PART FAILURE, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONAL:
The failure is questionable. Per NSTS 22206 the leak can not be through the packing in the valves penetration. The only other places could be the casing itself which is unrealistic or the O-ring which seals the valve to the bulkhead. The O-ring (lack of) is not big enough to drain the cabin faster than consummables flow. However, assuming crew inability to correct the failure leads to the assignment of an immediate loss of mission due to an uncontrollable leak.

REFERENCES:

REPORT DATE 03/10/88  E-73
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5096

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

ITEM: LINES & FITTINGS, 2 INCH DEPRESSURIZATION
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: R. DUFFY
SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) VACUUM VENT
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PART NUMBER:

CAUSES: MECHANICAL SHOCK, VIBRATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
THE LEAK CAN BE CONTROLLED WITH THE VACUUM VENT ISOLATION VALVE. LOSS OF FUNCTION CREATES A LEAK IN THE CABIN WITH THE POTENTIAL LOSS OF LIFE/VEHICLE. EVEN THOUGH THE VACUUM ISOLATION VALVE HAS A GAS DRAIN ORIFICE, THERE IS A POTENTIAL BUILD UP OF H2 IF THE LEAK IS DOWNSTREAM OF THIS INTERFACE, WHICH ALSO HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE IF H2 IGNITES. THUS, MISSION IS TERMINATED ON FIRST FAILURE.

REFERENCES:

REPORT DATE 03/10/88 E-74
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/14/88

SUBSYSTEM: LIFE SUPPORT

MDAC ID: 5097

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

ITEM: LINES & FITTINGS, 2 INCH DEPRESSURIZATION

FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: R. DUFFY

SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT
2) AIRLOCK
3) VACUUM VENT
4) VACUUM VENT
5) VACUUM VENT
6) VACUUM VENT
7) VACUUM VENT
8) VACUUM VENT
9) VACUUM VENT

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

LOCATION:

PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:
NO CRITICALITY HAS BEEN ASSIGNED BECAUSE THIS FAILURE IS NOT CREDIBLE. THE LINE IS 2 INCHES IN DIAMETER AND WOULD REQUIRE LARGE SIZE DEBRIS FOR EFFECTIVE PLUGGING. ON THE OTHER HAND, HYDROGEN IS A VERY LIGHT MOLECULE AND CAN PERMEATE THROUGH ANY SIZE CRACK. IF IOA HAD TO ASSIGNED A CRITICALITY, IT WOULD BE A 2/2 (LOSS OF MISSION) SINCE THE AIRLOCK WOULD BE UNABLE TO DEPRESSURIZE.

REFERENCES:

REPORT DATE 03/10/88 E-75
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 
SUBSYSTEM: LIFE SUPPORT
MDAC ID: 5098

ITEM: AIRLOCK DEPRESSURIZATION CAP
FAILURE MODE: INABILITY TO REMOVE

LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M. SAIIDI

BREAKDOWN HIERARCHY:
1) LIFE SUPPORT SYSTEM
2) AIRLOCK
3) DEPRESS SYSTEM
4) 
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CRITICALITIES

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

LOCATION:
PART NUMBER:

CAUSES: CONTAMINATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:
THE FAILURE TO REMOVE THE CAP CREATES LOSS OF THE VALVE FUNCTION AND POTENTIALLY LOSS OF MISSION DUE TO LOSS OF EVA CAPABILITY.

REFERENCES:

REPORT DATE 03/10/88 E-76
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. The Appendix F identifies: NASA FMEA Number, IOA Assessment Number, NASA criticality and redundancy screen data, and IOA recommendations.

Appendix F Legend

Code Definition

None.
## APPENDIX F

**NASA FMEA TO IDA WORKSHEET CROSS REFERENCE / RECOMMENDATIONS**

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