INDEPENDENT ORBITER ASSESSMENT

ASSESSMENT
OF THE
CREW EQUIPMENT
SUBSYSTEM

12 FEBRUARY 1988
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This Working Paper is Submitted to NASA under
Task Order No. VA88005, Contract NAS 9-17650

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</tbody>
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Independent Orbiter Assessment
Assessment of the Crew Equipment FMEA/CIL

1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the STS Orbiter and GFE Projects Office to perform the hardware analysis using the instructions and ground rules defined in NSTS 22206, Instructions for Preparation of FMEA and CIL, 3 November 1987, Change No. 4.

The IOA effort first completed an analysis of the Crew Equipment hardware, generating draft failure modes and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained within the NASA FMEA/CIL documentation. The IOA results were then compared to the NASA FMEA/CIL baseline with proposed Post 51-L updates included. A resolution of each discrepancy from the comparison is provided through additional analysis as required. This report documents the results of that comparison for the Orbiter Crew Equipment hardware.

The analysis was performed on only a subset of the crew equipment. This subset was agreed upon during negotiation between MDAC and the STS Orbiter and GFE Projects Offices. The subset includes crew equipment which meets the following criteria: (1) normally manifested on every flight; (2) has received final design approval; and (3) is covered by a NASA FMEA/CIL.

The IOA product for the Crew Equipment analysis consisted of 352 failure mode "worksheets" that resulted in 78 potential critical items being identified. Comparison was made to the NASA baseline (as of 1 January 1988) which consisted of 351 FMEAs and 82 CIL items. The comparison determined if there were any results which had been found by the IOA but were not in the NASA baseline. Figure 1 presents a comparison of the proposed Post 51-L NASA baseline, with the IOA recommended baseline, and any issues.

The issues arose due to differences between the NASA and IOA FMEA/CIL preparation instructions. NASA had used an older ground rules document which has since been superseded by the NSTS 22206 used by the IOA. After comparison, there were no discrepancies found that were not already identified by NASA, and the remaining issues may be attributed to differences in ground rules.
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</tr>
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<td>FMEA 422 351 123 FMEA 80 82 4</td>
</tr>
<tr>
<td>IVA TOOLS IOA NASA ISSUES 18 19 0</td>
</tr>
<tr>
<td>FMEA CIL 0 0 0</td>
</tr>
<tr>
<td>FOOD ASSEMBLIES IOA NASA ISSUES 146 110 53</td>
</tr>
<tr>
<td>FMEA CIL 0 0 0</td>
</tr>
<tr>
<td>ORBITER HARDWARE IOA NASA ISSUES 50 35 29</td>
</tr>
<tr>
<td>FMEA CIL 2 2 0</td>
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<tr>
<td>EVA EQUIPMENT</td>
</tr>
<tr>
<td>FMEA 75 66 23 FMEA 1 1 0</td>
</tr>
<tr>
<td>EVA TETHERS IOA NASA ISSUES 34 33 4</td>
</tr>
<tr>
<td>FMEA CIL 18 20 2</td>
</tr>
<tr>
<td>EVA TOOLS IOA NASA ISSUES 99 88 14</td>
</tr>
<tr>
<td>FMEA CIL 59 59 2</td>
</tr>
</tbody>
</table>

Figure 1 - CREW EQUIPMENT FMEA/CIL ASSESSMENT
2.0 INTRODUCTION

2.1 Purpose

The 51-L Challenger accident prompted the NASA to readdress safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of re-evaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the proposed Post 51-L Orbiter FMEA/CIL for completeness and technical accuracy.

2.2 Scope

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and GFE hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, functions, internal and external interfaces, and operational requirements for all mission phases.

2.3 Analysis Approach

The independent analysis approach is a top-down analysis utilizing as-built drawings to breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and are used to assess the proposed Post 51-L NASA and Prime Contractor FMEA/CIL. The IOA analysis approach is summarized in the following Steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEA/CIL which is documented in this report.

Step 1.0 Subsystem Familiarization
1.1 Define subsystem functions
1.2 Define subsystem components
1.3 Define subsystem specific groundrules and assumptions

Step 2.0 Define subsystem analysis diagram
2.1 Define subsystem
2.2 Define major assemblies
2.3 Develop detailed subsystem representations

Step 3.0 Failure events definition
3.1 Construct matrix of failure modes
3.2 Document IOA analysis results
Step 4.0 Compare IOA analysis data to NASA FMEA/CIL
   4.1 Resolve differences
   4.2 Review in-house
   4.3 Document assessment issues
   4.4 Forward findings to Project Manager

2.4 Groundrules and Assumptions

The groundrules and assumptions used in the IOA are defined in Appendix B. The subsystem specific groundrules were defined to provide necessary additions and clarifications to the ground rules and assumptions contained in NSTS 22206.
3.0 SUBSYSTEM DESCRIPTION

3.1 Design and Function

The Crew Equipment consists of that hardware required for support of crew activities during flight. It includes both IVA and EVA support equipment.

3.2 Interfaces and Locations

The crew equipment items are located in both the crew compartment and the payload bay.

3.3 Hierarchy

The overall hierarchy for crew equipment is shown in Figure 2. Detailed breakdown are presented in Figures 3 through 12.
Figure 29: Crew Equipment Hierarchy
Figure 30: EMU Light Assembly Hierarchy
Figure 31: EVA Tether Hierarchy
Figure 32: Payload Bay Door Tools Hierarchy
Figure 34: RMS Tool Hierarchy
Figure 35: IFM Breakout Box Hierarchy
Figure 36: Galley Hierarchy
Figure 37: OWDA Hierarchy
Figure 38: Orbiter Hardware Hierarchy
Figure 39: COAS Hierarchy
4.0 ASSESSMENT RESULTS

The IOA analysis of the Crew Equipment hardware initially generated 352 failure mode worksheets and identified 78 Potential Critical Items (PCIs) before starting the assessment process. In order to facilitate comparison, 78 additional failure mode analysis worksheets were generated. These analysis results were compared to the proposed NASA Post 51-L baseline of 351 FMEAs and 82 CIL items. The FMEAs that remained had minor discrepancies that did not affect criticality.

A summary of the quantity of NASA FMEAs assessed, versus the recommended IOA baseline, and any issues identified is presented in Table I.

<table>
<thead>
<tr>
<th>Component</th>
<th>NASA</th>
<th>IOA</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVA Equipment</td>
<td>66</td>
<td>75</td>
<td>23</td>
</tr>
<tr>
<td>EVA Tethers</td>
<td>33</td>
<td>34</td>
<td>4</td>
</tr>
<tr>
<td>EVA Tools</td>
<td>88</td>
<td>99</td>
<td>14</td>
</tr>
<tr>
<td>IVA Tools</td>
<td>19</td>
<td>18</td>
<td>-</td>
</tr>
<tr>
<td>Food Assemblies</td>
<td>110</td>
<td>146</td>
<td>53</td>
</tr>
<tr>
<td>Orbiter Hardware</td>
<td>35</td>
<td>50</td>
<td>29</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>351</strong></td>
<td><strong>422</strong></td>
<td><strong>123</strong></td>
</tr>
</tbody>
</table>

A summary of the quantity of NASA CIL items assessed, versus the recommended IOA baseline, and any issues identified is presented in Table II.

<table>
<thead>
<tr>
<th>Component</th>
<th>NASA</th>
<th>IOA</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVA Equipment</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>EVA Tethers</td>
<td>20</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>EVA Tools</td>
<td>59</td>
<td>59</td>
<td>2</td>
</tr>
<tr>
<td>IVA Tools</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Food Assemblies</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Orbiter Hardware</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>82</strong></td>
<td><strong>80</strong></td>
<td><strong>4</strong></td>
</tr>
</tbody>
</table>
Appendix C presents the detailed assessment worksheets for each failure mode identified and assessed. Appendix D highlights the NASA Critical Items and corresponding IOA worksheet ID. Appendix E contains IOA analysis worksheets supplementing previous analysis results reported in Space Transportation System Engineering and Operations Support (STSEOS) Working Paper No. 1.0-WP-VA870001-01, Analysis of the Crew Equipment Subsystem, 02 November 1987. Appendix F provides a cross reference between the NASA FMEA and corresponding IOA worksheet(s). IOA recommendations are also summarized.

Table III presents a summary of the IOA recommended failure criticalities for the Post 51-L FMEA baseline. Further discussion of each of these subdivisions and the applicable failure modes is provided in subsequent paragraphs.

<table>
<thead>
<tr>
<th>Criticality:</th>
<th>1/1</th>
<th>2/1R</th>
<th>2/2</th>
<th>3/1R</th>
<th>3/2R</th>
<th>3/3</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVA Equipment</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>49</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>EVA Tethers</td>
<td>15</td>
<td>3</td>
<td>-</td>
<td>1</td>
<td>15</td>
<td></td>
<td>34</td>
</tr>
<tr>
<td>EVA Tools</td>
<td>23</td>
<td>34</td>
<td>6</td>
<td>3</td>
<td></td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>IVA Tools</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>-</td>
<td>10</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Food Assemblies</td>
<td>-</td>
<td>-</td>
<td>45</td>
<td>101</td>
<td></td>
<td>146</td>
<td></td>
</tr>
<tr>
<td>Orbiter Hardware</td>
<td>-</td>
<td>2</td>
<td>6</td>
<td></td>
<td>42</td>
<td></td>
<td>50</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>39</td>
<td>39</td>
<td>20</td>
<td>98</td>
<td>226</td>
<td>422</td>
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Of the failure modes analyzed, 80 were determined to be critical items. A summary of the IOA recommended critical items is presented in Table IV.

<table>
<thead>
<tr>
<th>Criticality:</th>
<th>1/1</th>
<th>2/1R</th>
<th>2/2</th>
<th>3/1R</th>
<th>3/2R</th>
<th>3/3</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVA Equipment</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>EVA Tethers</td>
<td>15</td>
<td>3</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>18</td>
</tr>
<tr>
<td>EVA Tools</td>
<td>23</td>
<td>34</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>59</td>
</tr>
<tr>
<td>IVA Tools</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Food Assemblies</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Orbiter Hardware</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>39</td>
<td>39</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>80</td>
</tr>
</tbody>
</table>
The scheme for assigning IOA assessment (Appendix C) and analysis (Appendix E) worksheet numbers is shown in Table V.

<table>
<thead>
<tr>
<th>Component</th>
<th>IOA ID Number</th>
<th>FMEAs 'ADDED TO ORIGINAL ANALYSIS</th>
</tr>
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<tbody>
<tr>
<td>EVA Equipment</td>
<td>CRWEQP 1100-1499</td>
<td>11100-11499</td>
</tr>
<tr>
<td>EVA Tethers</td>
<td>CRWEQP 2100-2399</td>
<td>12100-12399</td>
</tr>
<tr>
<td>EVA Tools</td>
<td>CRWEQP 3100-3899</td>
<td>13100-13899</td>
</tr>
<tr>
<td>IVA Tools</td>
<td>CRWEQP 4100-4399</td>
<td>14100-14399</td>
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<tr>
<td>Food Assemblies</td>
<td>CRWEQP 5100-5499</td>
<td>15100-15499</td>
</tr>
<tr>
<td>Orbiter Hardware</td>
<td>CRWEQP 6100-6599</td>
<td>16100-16599</td>
</tr>
</tbody>
</table>

4.1 EVA Equipment Assessment Results

The IOA analysis identified five failure modes of the EVA scissors. The NASA determined the EVA scissors were non-critical items, so there were no FMEA/CILs available for comparison. The assessment of the EMU light assembly generated eight new failure modes. One of these failure modes (MDAC ID 11216) shows the battery cell as a criticality 1/1 because of the possibility of toxic venting or explosion. Three new FMEAs were generated for the OBS. The IOA analysis of the OBS identified five failure modes which were not considered by NASA. The failure modes were not critical, but were included for completeness. The assessment of the PFR generated one new FMEA, which was not critical.

4.2 EVA Tethers Assessment Results

The IOA disagrees with NASA's analysis of a hook failing to close as criticality 1/1. The failure mode implies that the hook is not in use, so its failure will not lead to an unrestrained crewmember. The IOA differs with NASA on this issue for both the ERCM safety tether and the waist tether. For all other failure modes, MDAC either agrees with, or accepts NASA's analysis.

4.3 EVA Tools Assessment Results

The NASA analysis does not include a failure mode corresponding to a failure of the three-point latch hook. This failure mode should be added to the NASA's FMEA/CIL data base. The IOA believes that NASA's analysis of the snatch block hook latch as a criticality 2/1R is too high and should be lowered. If the hook latch fails to close, then the tool is not in use at that time. For the other EVA tools, the IOA either agrees with or accepts NASA's results.
4.4 IVA Tools Assessment Results

The FMEA/CIL assessment recommends deleting three FMEAs as being non-credible failures (MDAC IDs 4200, 4307, 4310). With these deletions, IOA agrees completely with NASA on the IVA tools that were analyzed. All of the tools were found to be non-critical primarily because of redundant hardware.

4.5 Food Assemblies Assessment Results

The IOA found that none of the hardware which had been analyzed were critical hardware. IOA identified 35 FMEAs which were not analyzed by NASA, and generated 44 new FMEAs to correspond to failure modes NASA identified which had not been analyzed by IOA. The slight differences in criticality ratings of FMEAs between IOA and NASA is primarily due to differences in groundrules. During the assessment process it was determined that five IOA failure modes were non-credible and IOA recommends that these be deleted.

4.6 Orbiter Hardware Assessment Results

The IOA found that none of the orbiter hardware, which had been analyzed, were critical hardware. The assessment did generate two new FMEAs for the treadmill and six new FMEAs for the COAS. The assessment recommends accepting NASA's FMEAs and criticalities for the mid-deck stowage lockers.
5.0 REFERENCES

Reference documentation available from NASA and Rockwell was used in the analysis. The documentation used included the following:

1. NSTS 22206 Instructions for preparation of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL), Change No. 4, 11-3-87.

2. V602-660302 EO A-09, Turnbuckle, 4-23-85.


4. 10131-10031, Treadmill Exerciser Assembly, 9-25-84.


7. V620-660720 EO B-02, COAS Forward Bracket, 7-26-85.

8. SED 48101600 Rev A, Operational Water Dispenser Assembly, 2-10-83.

9. V602-660604 EO B-17, Locker Assembly, 11-8-84.

10. SED 48101607 Rev A, Contingency Water Dispenser Assembly, 8-18-82.

11. SED 33102357 Rev A DCN 8-5-82, Snatch Block Assembly, 8-5-82.

12. 10159-20076, EVA Scissors Assembly, 5-9-83.


15. SED33101621 DCN 1/25/83, Centerline Latch Tool Assembly, 1-25-83.

16. SED 33101327 Rev C, Three Point Latch Tool Assembly, 5-5-84.

17. SED 33101570, EVA Winch and Mount Assembly, 2-16-80.

18. 10163-10063, Payload Retention Device, 1-12-82.

19. 10134-20001, In-Flight Maintenance Breakout Box, 4-2-85.

20. V617-544702, EVA Operational Slidewire System Link 7-8-82.

22. V617-544701, EVA Operational Slidewire System Yoke, 7-7-82.
23. V617-544720, EO B-01 EVA Operational Slidewire, 7-22-85
24. 10161-10061, EMU Lights Assembly, 5-2-81.
25. 10161-60029, EMU Light Sequencer Mark IV Schematic, 11-29-83.
26. 10161-20033, Gimbal Assembly: EMU Lights Assembly, 4-29-81.
28. SED 42100961, Operational Bioinstrumentation System EVA Cable Assembly, 10-10-84.
29. 10162-10062 EO 101-374, Extended Range Crew Member Safety Tether Assembly, 8-30-85.
30. 10151-20040, Waist Tether Assembly, 1-23-80.
32. 10155-20003, Portable Foot Restraint Boom Assembly, 11-1-82.
33. 10155-20004, Portable Foot Restraint Centerline Clamp Assembly, 3-7-85.
34. 10155-10035, Portable Foot Restraint Articulating Socket Assembly, 5-7-82.
35. V601-669100 Rev B, Sleep Station Restraint Assembly, 2-14-84.
36. JSC 20466, EVA Catalog Tools and Equipment, 11-4-85.
38. SSSH 9.5, Crew Optical Alignment Sight Assembly, 10-18-83.
39. JSC-20365, Food System and Dining Workbook.
40. JSC-17321, FDF: IFM Checklist.
41. EVA Prep/Post 2102 Training Workbook.
## APPENDIX A
### ACRONYMS

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<tr>
<th>Acronym</th>
<th>Definition</th>
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<td>AOA</td>
<td>Abort-Once-Around</td>
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<tr>
<td>ASE</td>
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<td>ATO</td>
<td>Abort-To-Orbit</td>
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<tr>
<td>C&amp;W</td>
<td>Caution and Warning</td>
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<td>COAS</td>
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<td>CWDA</td>
<td>Contingency Water Dispenser Assembly</td>
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<td>dc</td>
<td>Direct Current</td>
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<td>EMU</td>
<td>Extravehicular Mobility Unit</td>
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<td>ERCM</td>
<td>Extended Range Crew Member</td>
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<td>Fahrenheit</td>
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<td>Failure Modes and Effects Analysis</td>
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<td>Intravehicular Activity</td>
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<td>NSTS</td>
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<td>OBS</td>
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<td>OWDA</td>
<td>Operational Water Dispenser Assembly</td>
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<td>PCI</td>
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<td>Provision Stowage Assembly</td>
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<td>psi</td>
<td>Pounds per Square Inch</td>
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<td>QD</td>
<td>Quick Disconnect</td>
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<td>Volt</td>
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APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.1 Definitions
B.2 Project Level Ground Rules and Assumptions
B.3 Subsystem-Specific Ground Rules and Assumptions
B.1 Definitions

Definitions contained in NSTS 22206, Instructions For Preparation of FMEA/CIL, 10 October 1986, change 4, 3 November 1987, were used with the following amplifications and additions.

**INTACT ABORT DEFINITIONS:**

- **RTLS** - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight
- **TAL** - begins at declaration of the abort and ends at transition to OPS 9, post-flight
- **AOA** - begins at declaration of the abort and ends at transition to OPS 9, post-flight
- **ATO** - begins at declaration of the abort and ends at transition to OPS 9, post-flight

**CREDIBLE (CAUSE)** - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

**CONTINGENCY CREW PROCEDURES** - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

**EARLY MISSION TERMINATION** - termination of onorbit phase prior to planned end of mission

**EFFECTS/RATIONALE** - description of the case which generated the highest criticality

**HIGHEST CRITICALITY** - the highest functional criticality determined in the phase-by-phase analysis

**MAJOR MODE (MM)** - major sub-mode of software operational sequence (OPS)

**MC** - Memory Configuration of Primary Avionics Software System (PASS)

**MISSION** - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)
MULTIPLE ORDER FAILURE - describes the failure due to a single cause or event of all units which perform a necessary (critical) function.

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards.

OPS - software operational sequence.

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives.

PHASE DEFINITIONS:

PRELAUNCH PHASE - begins at launch count-down Orbiter power-up and ends at moding to OPS Major Mode 102 (liftoff).

LIFTOFF MISSION PHASE - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT).

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8.

DEORBIT PHASE - begins at transition to OPS Major Mode 301 and ends at first main landing gear touchdown.

LANDING/SAFING PHASE - begins at first main gear touchdown and ends with the completion of post-landing safing operations.
B.2 IOA Project Level Ground Rules and Assumptions

The philosophy embodied in NSTS 22206, Instructions for Preparation of FMEA/CIL, 10 October 1986, change 4, 3 November 1987 was employed with the following amplifications and additions.

1. The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

   RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

   RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

3. Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

   RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

   RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

   RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

   RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.
7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

**RATIONALE:** Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

**RATIONALE:** Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables, and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

**RATIONALE:** Analysis was substantially complete prior to NSTS 22205 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

**RATIONALE:** Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

**RATIONALE:** Clarify definition of emergency systems to ensure consistency throughout IOA project.
B.3 Crew Equipment Specific Ground Rules and Assumptions

The IOA analysis was performed to the component or assembly level of the crew equipment subsystem. The analysis considered the worst case effects of the hardware or functional failure on the subsystem, mission, and crew and vehicle safety.

1. Waist tether is used to fasten a crewmember to either a workstation or to the ERCM safety tether. It is not used to restrain tools.

   RATIONALE: Worst case possibility.

2. The Operational Bioinstrumentation System (OBS) will be considered as a non-mandatory item for EVA operations. Failure of the OBS while monitoring an IVA crewmember can require the Flight Surgeon to terminate the mission. Thus, IVA usage is more critical.

   RATIONALE: IVA crewmembers are hooked to the OBS only at the request of the Flight Surgeon. If a crewmember's health cannot be monitored, the Flight Surgeon has the option of terminating the mission.

3. Crew actions, planned and unplanned, are considered viable alternatives for overcoming failures and reducing criticalities.

   RATIONALE: Crew equipment is designed to permit this capability.

4. "Normally expected environmental conditions" precludes the existence of contamination in all water lines.

   RATIONALE: Interpretation and application of redundancy screen C.

5. Lockers are assumed to contain emergency, lifesaving, or IFM critical equipment.

   RATIONALE: Worst case possibility.

6. Crew equipment failures discovered prior to launch will be corrected prelaunch.

   RATIONALE: Interpretation of flight rules.

7. RMS jettison is considered unlike redundancy to RMS stowing.

   RATIONALE: Definition of redundancy.
8. The EMU lights are not designated as mandatory items during EVA.

RATIONALE: Definition of mandatory versus non-mandatory requirements.

9. The failure of an EVA tether such that the crewmember is unrestrained will be assigned a "1/1" criticality.

RATIONALE: Worst case possibility

10. Certain galley and OWDA failures can result in free water in the cabin. It is not a part of this task to identify the hazards that free water can pose to other on-board systems.

RATIONALE: This should be addressed by a "hazard analysis".

11. Complete loss of the galley will not terminate a mission as long as alternate water sources are available.

RATIONALE: The FDF contains procedures to bypass the galley for water if required. Other galley functions are not required for completion of mission.
APPENDIX C
DETAILED ASSESSMENT

This section contains the IOA assessment worksheets generated during the assessment of this subsystem. The information on these worksheets facilitates the comparison of the NASA FMEA/CIL (Pre and Post 51-L) to the IOA detailed analysis worksheets included in Appendix E. Each of these worksheets identifies the NASA FMEA being assessed, corresponding MDAC Analysis Worksheet ID (Appendix E), hardware item, criticality, redundancy screens, and recommendations. For each failure mode, the highest assessed hardware and functional criticality is compared and discrepancies noted as "N" in the compare row under the column where the discrepancy occurred.

LEGEND FOR IOA ASSESSMENT 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 Screens A, B and C:
P  = Passed Screen
F  = Failed Screen
NA = Not Applicable

NASA Data :
Baseline  = NASA FMEA/CIL
New       = Baseline with Proposed Post 51-L Changes

CIL Item :
X  = Included in CIL

Compare Row :
N  = Non compare for that column (deviation)
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/10/87
ASSESSMENT ID: CRWEQP-1100
NASA FMEA #:

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1100
ITEM: EVA SCISSORS - SPRING

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE
INADEQUATE

REMARKS:
THIS ITEM WAS DETERMINED BY NASA TO BE NON-CRITICAL ITEM NOT REQUIRING ANY FMEAs.

REPORT DATE 02/12/88  C-2
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/10/87
ASSESSMENT ID: CRWEQP-1101
NASA FMEA #: NASA
BASELINE [ ] NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1101
ITEM: EVA SCISSORS - BLADE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

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REMARKS:
THIS ITEM WAS DETERMINED BY NASA TO BE NON-CRITICAL ITEM NOT REQUIRING ANY FMEAS.

REPORT DATE 02/12/88 C-3
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/10/87
ASSESSMENT ID: CRWEQP-1102
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1102 NASA BASELINE [ ]
ITEM: EVA SCISSORS - BLADES NEW [ ]

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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REMARKS:

THIS ITEM WAS DETERMINED BY NASA TO BE NON-CRITICAL ITEM NOT REQUIRING ANY FMEAs.

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APPENDIX C
ASSESSMENT WORKSHEET

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ASSESSMENT ID: CRWEQP-1103
NASA FMEA #: NASA DATA:
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SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1103
ITEM: EVA SCISSORS LOCKING BAR

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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REMARKS:
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REPORT DATE 02/12/88 C-5
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/10/87
ASSESSMENT ID: CRWEQP-1104
NASA FMEA #: 

ASSESSMENT ID: CRWEQP-1104
NASA FMEA #: 

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1104
ITEM: EVA SCISSORS HINGE PIN

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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REMARKS:

THIS ITEM WAS DETERMINED BY NASA TO BE NON-CRITICAL ITEM NOT REQUIRING ANY FMEAs.
APPENDIX C
ASSESSMENT WORKSHEET

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ASSESSMENT ID: CRWEQP-1200
NASA FMEA #: JSC22453-8B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1200
ITEM: EMU LIGHT ASSEMBLY - SEQUENCING CIRCUIT BATTERY

LEAD ANALYST: S.K. SINCLAIR

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REMARKS:

REPORT DATE 02/12/88 C-7
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1201
NASA FMEA #: JSC22453-8B

NASA DATA:
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1201
ITEM: EMU LIGHT ASSEMBLY - SEQUENCING CIRCUIT THERMOSTAT

LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

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REMARKS:

REPORT DATE 02/12/88 C-8
APPENDIX C
ASSESSMENT WORKSHEET

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ASSESSMENT ID: CRWEQP-1202
NASA FMEA #: JSC22453-5A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1202
ITEM: EMU LIGHT ASSEMBLY - SEQUENCING CIRCUIT THERMOSTAT

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-9
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1203
NASA FMEA #: JSC22453-8A

NASA DATA:
BASELINE [   ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1203
ITEM: EMU LIGHT ASSEMBLY - SEQUENCING CIRCUIT SWITCH
LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-10
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1204
NASA FMEA #: JSC22453-8B
NASA DATA:
BASELINE [ ]
NEW [ x ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1204
ITEM: EMU LIGHT ASSEMBLY - SEQUENCING CIRCUIT

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-11
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1205
NASA FMEA #: JSC22453-7A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1205
ITEM: EMU LIGHT ASSEMBLY - BULB

LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-12
APPENDIX C
ASSessment WORKSHEET

ASSESSMENT DATE: 12/07/87  NASA DATA:
ASSESSMENT ID:    CRWEQP-1206    BASELINE [ ]
NASA FMEA #:      JSC22453-9A    NEW [ X ]
SUBSYSTEM:       CREW EQUIPMENT
MDAC ID:          1206
ITEM:             EMU LIGHT ASSEMBLY-GIMBAL
LEAD ANALYST:     S.K. SINCLAIR

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

REPORT DATE 02/12/88    C-13
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1207
NASA FMEA #: JSC22453-9A

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REMARKS:

REPORT DATE 02/12/88  C-14
### APPENDIX C
**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 12/07/87  
**ASSESSMENT ID:** CRWEQP-1208  
**NASA FMEA #:** JSC22453-9A  
**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 1208  
**ITEM:** EMU LIGHT ASSEMBLY-GIMBAL  
**LEAD ANALYST:** S.K. SINCLAIR  

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* CIL RETENTION RATIONALE: (If applicable)

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**REPORT DATE 02/12/88**  
C-15
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1209
NASA FMEA #: JSC22453-10A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1209
ITEM: EMU LIGHT ASSEMBLY-HELMET LATCH
LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

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REMARKS:

REPORT DATE 02/12/88  C-16
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1210
NASA FMEA #: JSC22453-10A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1210
ITEM: EMU LIGHT ASSEMBLY-HELMET LATCH
LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
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REPORT DATE 02/12/88 C-17
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1211
NASA FMEA #: JSC22453-10A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1211
ITEM: EMU LIGHT ASSEMBLY-CROSS MEMBER

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-18
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1212
NASA FMEA #: JSC22453-3A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1212
ITEM: EMU LIGHT ASSEMBLY-BATTERY

LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)
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REPORT DATE 02/12/88 C-19
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87  NASA DATA:
ASSESSMENT ID: CRWEQP-1213  BASELINE [ ]
NASA FMEA #: JSC22453-3A  NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1213
ITEM: EMU LIGHT ASSEMBLY BATTERY-INTERNAL FUSE

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

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REMARKS:

REPORT DATE 02/12/88 C-20
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-1214
NASA FMEA #: JSC22453-3A

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1214
ITEM: EMU LIGHT ASSEMBLY - BATTERY CONTACTS

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-21
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-1300
NASA FMEA #: OBS 2A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1300
ITEM: OBS - SIGNAL CONDITIONER
LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NOTE: IOA CRITICALITY IS BEING MATCHED TO NASA's IVA CRITICALITY INSTEAD OF NASA's EVA CRITICALITY. THE IVA ANALYSIS IS ASSUMED TO REFLECT WORST CASE CONDITIONS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-1301
NASA FMEA #: OBS 2C
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1301
ITEM: OBS - SIGNAL CONDITIONER - BATTERY

LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

IOA CRITICALITY MATCHED TO NASAs IVA CRITICALITY TO REFLECT WORST CASE ANALYSIS.

REPORT DATE 02/12/88 C-23
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1301A
NASA FMEA #: OBS 5A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1301
ITEM: OBS - SIGNAL CONDITIONER - BATTERY
LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-24
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1302
NASA FMEA #: NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1302
ITEM: OBS - SIGNAL CONDITIONER - ON/OFF SWITCH

LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. SHOULD BE ADDED FOR COMPLETENESS AND TO COVER ALL POSSIBLE FAILURE MODES.

REPORT DATE 02/12/88 C-25
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-1303
NASA FMEA #: OBS 2A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1303
ITEM: OBS - SIGNAL CONDITIONER - GAIN

LEAD ANALYST: S.K. SINCLAIR

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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 02/12/88 C-26
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-1304
NASA FMEA #: OBS 3A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1304
ITEM: OBS - SIGNAL CONDITIONER - INPUT PORT

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

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

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

REMARKS:

REPORT DATE 02/12/88 C-27
### APPENDIX C
### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 12/10/87  
**ASSESSMENT ID:** CRWEQP-1305  
**NASA FMEA #:** OBS 3A  
**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 1305  
**ITEM:** OBS - SIGNAL CONDITIONER - OUTPUT PORT  
**LEAD ANALYST:** S.K. SINCLAIR

**ASSESSMENT:**

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| COMPARISON | [ ] | [ ] | [ ] | [ ] | [ ] |

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

| [ ] | [ ] | [ ] | [ ] | [ ] |

(ADD/DELETE)

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

**ADEQUATE** [ ]  
**INADEQUATE** [ ]

**REMARKS:**

IOA FMEA 1305 IS MATCHED TO THE NASA FMEA FOR THE IVA CABLE DUE TO A MATCHING OF THE CAUSE DESCRIPTIONS - BENT PINS IN EITHER THE CABLE OR CABLE CONNECTOR.

**REPORT DATE** 02/12/88  
**C-28**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1306
NASA FMEA #: OBS 2A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1306
ITEM: OBS - SIGNAL CONDITIONER - ESP

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

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

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

REMARKS:
The IOA FMEA 1306 IS MATCHED TO THE IVA CRITICALITY NUMBERS OF THE NASA FMEA. IVA CRITICALITY REPRESENTS THE WORST CASE ANALYSIS AND IS CONSISTENT WITH IOA GROUND RULES.

REPORT DATE 02/12/88 C-29
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1307
NASA FMEA #: [ ]
NASA DATA: [ ]
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1307
ITEM: OBS - BIOMED BELT
LEV ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
NO EQUIVALENT NASA FMEA. NON-CRITICAL FAILURE SHOULD BE ADDED FOR COMPLETENESS.

REPORT DATE 02/12/88    C-30
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1308
NASA FMEA #: OBS 1B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1308
ITEM: OBS - ELECTRODE HARNESS WIRES

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

REMARKS:

REPORT DATE 02/12/88 C-31
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1309
NASA FMEA #: OBS 1A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1309
ITEM: OBS - ELECTRODES

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

NASA [ 3 /2R ] [ P ] [ NA] [ P ] [ ] *
IOA [ 3 /2R ] [ P ] [ NA] [ P ] [ ]
COMPARE [ / ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

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

REMARKS:

REPORT DATE 02/12/88 C-32
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1310
NASA FMEA #: OBS 1B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1310
ITEM: OBS - ELECTRODE HARNESS

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-33
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1311
NASA FMEA #: NASA FMEA #:

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1311
ITEM: OBS - ELECTRODE HARNESS - PIN CONNECTOR/PINS

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. SHOULD BE ADDED FOR COMPLETENESS AND TO COVER ALL POSSIBLE FAILURE MODES.

REPORT DATE 02/12/88 C-34
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1312
NASA FMEA #: OBS 4A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1312
ITEM: OBS - EVA BIOMED CABLE

LEAD ANALYST: S.K. SINCLAIR

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 02/12/88 C-35
ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1313
NASA FMEA #: OBS 4B

NASA DATA:
BASELINE
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1313
ITEM: OBS - EVA BIOMED CABLE - PINS/PIN CONNECTOR

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-36
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1314
NASA FMEA #: OBS 3A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1314
ITEM: OBS - IVA BIOMED CABLE
LEAD ANALYST: S.K. SINCLAIR

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

REMARKS:

REPORT DATE 02/12/88 C-37
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1315
NASA FMEA #: OBS 3A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1315
ITEM: OBS - IVA BIOMED CABLE - PINS/PIN CONNECTOR

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-38
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1316
NASA FMEA #: CRWEQP-1316
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1316
ITEM: BIOMED CHANNEL SWITCH
LEAD ANALYST: S.K. SINCLAIR

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

REMARKS:
NO EQUIVALENT NASA FMEA. NASA ANALYSIS DID NOT CONSIDER THIS ITEM AS A PART OF THE OBS.

REPORT DATE 02/12/88 C-39
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1317
NASA FMEA #: NASA FMEA
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1317
ITEM: BIOMED CHANNEL SWITCH
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. THE NASA OBS SYSTEM DESCRIPTION DID NOT INCLUDE THIS ITEM.

REPORT DATE 02/12/88 C-40
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1318
NASA FMEA #: OBS 3A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1318
ITEM: BIOMED PANEL CABLE

LEAD ANALYST: S.K. SINCLAIR

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 02/12/88 C-41
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1319
NASA FMEA #: OBS 3A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1319
ITEM: BIOMED PANEL CABLE - PINS/PIN CONNECTOR

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88   C-42
ASSESSMENT DATE: 12/11/87
ASSESSMENT ID: CRWEQP-1320
NASA FMEA #: OBS 3A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1320
ITEM: BIOMED PANEL CABLE - SHUTTLE INTERFACES
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-43
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/16/87
ASSESSMENT ID: CRWEQP-1400
NASA FMEA #: JSC22480-1A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1400
ITEM: PORTABLE FOOT RESTRAINT PLATFORM ASSEMBLY
ADJUSTMENT KNOB

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-44
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/16/87
ASSESSMENT ID: CRWEQP-1401
NASA FMEA #: JSC22480-2A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1401
ITEM: PORTABLE FOOT RESTRAINT PLATFORM ASSEMBLY
LOCKING PLATES

LEAD ANALYST: H. SAXON

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* CIL RETENTION RATIONALE: (If applicable)
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REMARKS:

REPORT DATE 02/12/88 C-45
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/16/87
ASSESSMENT ID: CRWEQP-1402
NASA FMEA #: JSC22480-3A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1402
ITEM: PORTABLE FOOT RESTRAINT PLATFORM ASSEMBLY TOE BAR

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-46
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/16/87
ASSESSMENT ID: CRWEQP-1403
NASA FMEA #: JSC22480-4A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1403
ITEM: PORTABLE FOOT RESTRAINT PLATFORM ASSEMBLY HEEL LOCK

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:
## APPENDIX C
### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/16/87  
**ASSESSMENT ID:** CRWEQP-1404  
**NASA FMEA #:** JSC22480-4B  

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 1404  
**ITEM:** PORTABLE FOOT RESTRAINT PLATFORM ASSEMBLY HEEL LOCK  

**LEAD ANALYST:** H. SAXON  

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

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

**REPORT DATE** 02/12/88  
**C-48**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/16/87
ASSESSMENT ID: CRWEQP-1410
NASA FMEA #: JSC22480-5A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1410
ITEM: PORTABLE FOOT RESTRAINT TELESCOPING BOOM ASSEMBLY INBOARD CLAMP

LEAD ANALYST: H. SAXON

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-49
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/16/87  NASA DATA:
ASSESSMENT ID: CRWEQP-1411 BASELINE [ ]
NASA FMEA #: JSC22480-6A NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1411
ITEM: PORTABLE FOOT RESTRAINT TELESCOPING BOOM ASSEMBLY OUTBOARD CLAMP

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-50
# APPENDIX C
## ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/16/87  
**ASSESSMENT ID:** CRWEQP-1412  
**NASA FMEA #:** JSC22480-7A

**NASA DATA:**  
- **BASELINE:** [ ]  
- **NEW:** [ X ]

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 1412  
**ITEM:** PORTABLE FOOT RESTRAINT TELESCOPING BOOM ASSEMBLY PLATFORM CLAMP

**LEAD ANALYST:** H. SAXON

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

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

**REMARKS:**

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**REPORT DATE** 02/12/88  
**C-51**
**APPENDIX C**

**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 11/16/87  
**NASA DATA:**  
**ASSESSMENT ID:** CRWEQP-1413  
**NASA FMEA #:** JSC22480-7B  
**BASELINE**  
**NEW** [ X ]  

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 1413  
**ITEM:** PORTABLE FOOT RESTRAINT TELESCOPING BOOM ASSEMBLY PLATFORM CLAMP  

**LEAD ANALYST:** H. SAXON  

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

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* CIL RETENTION RATIONALE: (If applicable)  

ADEQUATE [ ]  

INADEQUATE [ ]  

**REMARKS:**

**REPORT DATE 02/12/88**  
**C-52**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEPQ-1414
NASA FMEA #: JSC22480-8A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1414
ITEM: PORTABLE FOOT RESTRAINT TELESCOPING BOOM ASSEMBLY QUICK RELEASE PIN

LEAD ANALYST: H. SAXON

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

REMARKS:

REPORT DATE 02/12/88 C-53
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-1415
NASA FMEA #: JSC22480-8B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1415
ITEM: PORTABLE FOOT RESTRAINT TELESCOPING BOOM ASSEMBLY QUICK RELEASE PIN

LEAD ANALYST: H. SAXON

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88   C-54
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-1416
NASA FMEA #: JSC22480-9A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1416
ITEM: PORTABLE FOOT RESTRAINT TELESCOPING BOOM ASSEMBLY INNER AND OUTER TUBES

LEAD ANALYST: H. SAXON

ASSESSMENT:

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

NASA [ 3 /2R ] [ P ] [ P ] [ P ] [ ] *
IOA [ 3 /2R ] [ P ] [ P ] [ P ] [ ]
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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-55
ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-1417
NASA FMEA #: JSC22480-10A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1417
ITEM: PORTABLE FOOT RESTRAINT TELESCOPING BOOM ASSEMBLY TORQUE LIMITER

LEAD ANALYST: H. SAXON

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

REMARKS:

REPORT DATE 02/12/88 C-56
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-1418
NASA FMEA #: JSC22480-10B
NASA DATA:
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1418
ITEM: PORTABLE FOOT RESTRAINT TElescoping Boom ASSEMBLY TORQUE LIMITER

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88    C-57
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-1420
NASA FMEA #: JSC22480-11A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1420
ITEM: PORTABLE FOOT RESTRAINT CENTERLINE CLAMP ASSEMBLY QUICK RELEASE PIN

LEAD ANALYST: H. SAXON

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-58
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-1421
NASA FMEA #: JSC22480-11B
NASA DATA:
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1421
ITEM: PORTABLE FOOT RESTRAINT CENTERLINE CLAMP ASSEMBLY QUICK RELEASE PIN

LEAD ANALYST: H. SAXON

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-59
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-1422
NASA FMEA #: JSC22480-12A

NASA DATA:
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NEW [  X  ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1422
ITEM: PORTABLE FOOT RESTRAINT CENTERLINE CLAMP
ASSEMBLY ALIGNMENT TABS

LEAD ANALYST: H. SAXON

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

REMARKS:

REPORT DATE 02/12/88 C-60
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87                   NASA DATA:
ASSESSMENT ID: CRWEQP-1423                  BASELINE [   ]
NASA FMEA #: JSC22480-13A                   NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1423
ITEM: PORTABLE FOOT RESTRAINT CENTERLINE CLAMP
ASSEMBLY CAPTURE JAWS

LEAD ANALYST: H. SAXON

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88   C-61
**APPENDIX C**

**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 11/17/87  
**ASSESSMENT ID:** CRWEQP-1424  
**NASA FMEA #:** JSC22480-14A

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 1424  
**ITEM:** PORTABLE FOOT RESTRAINT CENTERLINE CLAMP ASSEMBLY CLAMP KNOB

**LEAD ANALYST:** H. SAXON

**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 02/12/88**

C-62
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSessment ID: CRWEP-1430
NASA FMEA #: JSC22480-15A
NASA DATA: BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1430
ITEM: PORTABLE FOOT RESTRAINT ARTICULATING SOCKET
ASSEMBLY ADJUSTMENT KNOB

LEAD ANALYST: H. Saxon

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

RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-63
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-1431
NASA FMEA #: JSC22480-17A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 1431
ITEM: PORTABLE FOOT RESTRAINT ARTICULATING SOCKET ASSEMBLY LOCKING PLATES

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-64
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87  
ASSESSMENT ID: CRWEQP-1432  
NASA FMEA #: JSC22480-17A

NASA DATA:  
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 1432  
ITEM: PORTABLE FOOT RESTRAINT ARTICULATING SOCKET ASSEMBLY QUICK RELEASE PIN

LEAD ANALYST: H. SAXON

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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 02/12/88  C-65
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2100
NASA FMEA #: 07-1B-SW2-1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2100
ITEM: EVA SLIDEWIRE ASSEMBLY-SLIDE
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

NASA FMEA CONSIDERS THE POSSIBILITY OF CONNECTING TETHERS DIRECTLY TO THE SLIDEWIRE AND BYPASSING THE SLIDER. IOA AGREES WITH THIS PROCEDURE AND RECOMMENDS CHANGING CRITICALITY TO NASA FMEA 3/3.
ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2101
NASA FMEA #: 07-1B-SW1-1

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2101
ITEM: EVA SLIDEWIRE ASSEMBLY-SLIDE
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-67
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2102
NASA FMEA #: 07-1B-SW2-1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2102
ITEM: EVA SLIDEWIRE ASSEMBLY-SLIDE

LEAD ANALYST: S.K. SINCLAIR

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

RECOMMENDATIONS: (If different from NASA)

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

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS THE POSSIBILITY OF HAVING THE CREWMEMBER ATTACH THE TETHER DIRECTLY TO THE SLIDEWIRE AND COMPLETELY BYPASSING THE SLIDE(R). IOA AGREES WITH THIS PROCEDURE AND RECOMMENDS CHANGING CRITS TO MATCH NASA.

REPORT DATE 02/12/88 C-68
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-2103
NASA FMEA #: 07-1B-SW3-1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2103
ITEM: EVA SLIDEWIRE ASSEMBLY-STOP

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERS THE STOP AS A REDUNDANT METHOD OF KEEPING THE EVA CREWMEMBER ATTACHED TO THE SLIDEWIRE. IF THE STOP BREAKS FREE AND THE SLIDEWIRE BREAKS OUT OF THE END FITTINGS, THEN THE SLIDE(R) CAN BECOME LOOSE. THIS CAN RESULT IN AN UNRESTRAINED CREWMAN. IOA AGREES WITH THIS ANALYSIS AND RECOMMENDS CHANGING THE CRITICALITIES TO MATCH NASA.

REPORT DATE 02/12/88 C-69
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-2104
NASA FMEA #: 07-1B-SW6-1
NASA DATA:
BASELINE
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2104
ITEM: EVA SLIDEWIRE-END FITTINGS

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-70
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-2105
NASA FMEA #: 07-1B-SW6-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2105
ITEM: EVA SLIDEWIRE ASSEMBLY-COTTER PIN

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS:
(If different from NASA)

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(ADD/DELETE)

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

REMARKS:
COTTER PIN IS CONSIDERED PART OF THE SLIDEWIRE END FITTING.

REPORT DATE 02/12/88 C-71
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-2106
NASA FMEA #: 07-1B-SWS-I

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2106
ITEM: EVA SLIDEWIRE ASSEMBLY - QUICK DISCONNECT PIN

LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THE ENTIRE DEPLOYMENT LINKAGE AND YOKE ASSEMBLY AS ONE ENTITY, WITH NO REDUNDANCIES. UNDER THIS ASSUMPTION, IOA AGREES WITH THE NASA CRITS.

REPORT DATE 02/12/88 C-72
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-2107
NASA FMEA #: 07-1B-SW5-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2107
ITEM: EVA SLIDEWIRE ASSEMBLY - QUICK DISCONNECT PIN

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THE ENTIRE DEPLOYMENT YOKE AND LINK AS ONE ENTITY. CONSIDERATION WAS NOT GIVEN TO CREW ACTIONS IN CLEARING THE JAM BY ALTERNATE METHODS. WITH THESE TWO ASSUMPTIONS, IOA AGREES WITH THE NASA CRITICALITIES.

REPORT DATE 02/12/88 C-73
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-2108
NASA FMEA #: 07-1B-SW5-1

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2108
ITEM: EVA SLIDEWIRE ASSEMBLY-SUPPORT STRUCTURE

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THE ENTIRE DEPLOYMENT LINK/YOKE ASSEMBLY AS ONE ENTITY. NO CONSIDERATION IS GIVEN TO CREW ACTIONS IN REDUCING THE CRITICALITY AND SOLVING THE PROBLEM. UNDER THESE TWO ASSUMPTIONS, IOA AGREES WITH THE NASA CRITICALITIES.

REPORT DATE 02/12/88 C-74
## APPENDIX C
### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/19/87  
**ASSESSMENT ID:** CRWEQP-2109  
**NASA FMEA #:** 07-1B-SWI-I  
**NASA DATA:**
- BASELINE [ ]
- NEW [ X ]

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 2109  
**ITEM:** EVA SLIDEWIRE  
**LEAD ANALYST:** S.K. SINCLAIR

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

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

- ADEQUATE [ ]
- INADEQUATE [ ]

### REMARKS:

REPORT DATE 02/12/88  
C-75
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2200
NASA FMEA #: JSC17067B-1A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2200
ITEM: EXTENDED RANGE CREWMEMBER SAFETY TETHER-SMALL HOOK

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-76
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2201
NASA FMEA #: JSC17067B-1A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2201
ITEM: EXTENDED RANGE CREWMEMBER SAFETY TETHER-SMALL HOOK

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

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

REMARKS:
NASA FMEA HAS LUMPED THE FAILURE TO CLOSE INTO THE "HOOK BREAKS OR JAMS OPEN" FAILURE. THIS IS AN INAPPROPRIATE GROUPING SINCE JAMMING OPEN (OR FAILING TO CLOSE) IMPLIES THE HOOK IS NOT IN USE WHEN THE FAILURE OCCURS. FAILURE TO BE ABLE TO USE THE HOOK SHOULD NOT BE A 1/1, AND THE FMEA WILL BE DISCUSSED WITH THE SUBSYSTEM MANAGER.
**APPENDIX C**

**ASSESSMENT WORKSHEET**

ASSESSMENT DATE: 11/18/87

ASSESSMENT ID: CRWEQP-2202

NASA FMEA #: JSC17067B-1E

NASA DATA: BASELINE [ ] NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT

MDAC ID: 2202

ITEM: EXTENDED RANGE CREWMEMBER SAFETY TETHER—SMALL HOOK

LEAD ANALYST: S.K. SINCLAIR

**ASSESSMENT:**

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

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

**REMARKS:**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2203
NASA FMEA #: JSC170671B-1A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2203
ITEM: EXTENDED RANGE CREWMEMBER SAFETY TETHER-CABLE
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-79
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
NASA DATA:
ASSESSMENT ID: CRWEQP-2204
NASA FMEA #: JSC17067B-1A
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2204
ITEM: ERCM SAFETY TETHER-CABLE ATTACH POINTS

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-80
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2205
NASA FMEA #: JSC17067-1A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2205
ITEM: EXTENDED RANGE CREWMEMBER SAFETY TETHER-REEL CASE

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

* CIL RETENTION RATIONALE: (If applicable)

REMARKS:

REPORT DATE 02/12/88   C-81
### APPENDIX C
#### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/18/87  
**NASA DATA:**  
**ASSESSMENT ID:** CRWEQP-2206  
**BASELINE [ ]**  
**NASA FMEA #:** JSC17067B-1B  
**NEW [ X ]**

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 2206  
**ITEM:** ERCM SAFETY TETHER-CABLE TAKE UP ASSEMBLY

**LEAD ANALYST:** S.K. SINCLAIR

**ASSESSMENT:**

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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 02/12/88**

C-82
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWQP-2207
NASA FMEA #: JSC17067B-1D

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2207
ITEM: ERCM SAFETY TETHER–CABLE TAKE UP ASSEMBLY

LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

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REMARKS:

REPORT DATE 02/12/88
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2208
NASA FMEA #: JSC17067B-1D

NASA DATA:
BASELINE [    ]
NEW [ X  ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2208
ITEM: ERCM SAFETY TETHER-CABLE TAKE UP ASSEMBLY

LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)
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REMARKS:

REPORT DATE 02/12/88 C-84
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2209
NASA FMEA #: JSC17067B-1D
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2209
ITEM: ERCM SAFETY TETHER-CABLE TAKE UP ASSEMBLY

LEAD ANALYST: S.K. SINCLAIR

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

REPORT DATE 02/12/88 C-85
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2210
NASA FMEA #: JSC17067B-1D

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2210
ITEM: ERCM SAFETY TETHER-LOCK/UNLOCK SELECTOR SWITCH

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88  C-86
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2211
NASA FMEA #: JSC17067B-1D

NASA DATA:
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2211
ITEM: ERCM SAFETY TETHER-LOCK/UNLOCK SELECTOR SWITCH

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-87
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2212
NASA FMEA #: JSC17067B-1A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2212
ITEM: ERCM SAFETY TETHER-"D" RING

LEAD ANALYST: S.K. SINCLAIR

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:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2213
NASA FMEA #: NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2213
ITEM: ERCM SAFETY TETHER-"D" RING

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

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REMARKS:
NO CORRESPONDING NASA FMEA. 3/3 IS A NON-CRITICAL FAILURE, BUT IT SHOULD BE ADDED TO THE NASA DATA BASE FOR PURPOSES OF COMPLETENESS.

REPORT DATE 02/12/88 C-89
# APPENDIX C
## ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/18/87  
**ASSESSMENT ID:** CRWEQP-2300  
**NASA FMEA #:** JSC17067B-2A  
**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 2300  
**ITEM:** WAIST TETHER-HOOKS  
**LEAD ANALYST:** S.K. SINCLAIR

**ASSESSMENT:**

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

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

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**REMARKS:**

**REPORT DATE** 02/12/88  
C-90
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEP-2301
NASA FMEA #: JSC17067B-2A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2301
ITEM: WAIST TETHER-HOOKS
LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

THIS FAILURE IS UNDER NASA FMEA FAILURE "EITHER HOOK LATCH JAMS OPEN". MDAC FMEA CALLS "FAILS TO CLOSE" A NON-CRITICAL FAILURE SINCE TETHER IS NOT IN USE AT TIME OF FAILURE. FMEA WILL BE DISCUSSED WITH NASA SUBSYSTEM MANAGER.

REPORT DATE 02/12/88 C-91
## APPENDIX C
### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/18/87  
**ASSESSMENT ID:** CRWEQP-2302  
**NASA FMEA #:** JSC17067B-2B  
**NASA DATA:**  
- BASELINE [ ]  
- NEW [ X ]  

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 2302  
**ITEM:** WAIST TETHER-HOOKS  

**LEAD ANALYST:** S.K. SINCLAIR  

**ASSESSMENT:** CRITICALITY REDUNDANCY SCREENS  
**FLIGHT HDW/FUNC**  
**REDUNDANCY SCREENS**  
- A  
- B  
- C  

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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** 02/12/88  
C-92
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2302A
NASA FMEA #: JSC17067B-2C

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2302
ITEM: WAIST TETHER-HOOKS

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88
C-93
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2303
NASA FMEA #: JSC17067B-2A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2303
ITEM: WAIST TETHER-HOOKS
LEAD ANALYST: S.K. SINCLAIR

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LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

Adequate [ ]
Inadequate [ ]

REPORT DATE 02/12/88 C-94
**APPENDIX C**  
**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 11/18/87  
**NASA DATA:**  
**ASSESSMENT ID:** CRWEQP-2304  
**NASA FMEA #:** JSC17067B-2A  
**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 2304  
**ITEM:** WAIST TETHER-NOMEX WEBBING  
**LEAD ANALYST:** S.K. SINCLAIR

**ASSESSMENT:**

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

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

**REMARKS:**

**REPORT DATE 02/12/88**  
C-95
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-2305
NASA FMEA #: JSC17067B-2A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 2305
ITEM: WAIST TETHER-NOMEX WEBBING

LEAD ANALYST: S.K. SINCLAIR

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:

REPORT DATE 02/12/88 C-96
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87  
ASSESSMENT ID: CRWEQP-2306  
NASA FMEA #: JSC17067B-2A  
NASA DATA:  
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 2306  
ITEM: WAIST TETHER-NOMEX WEBBING  
LEAD ANALYST: S.K. SINCLAIR

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

REPORT DATE 02/12/88 C-97
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/30/87
ASSESSMENT ID: CRWEQP-3100
NASA FMEA #: TUBE CUTTER 6G

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3100
ITEM: TUBE CUTTER CUTTING WHEEL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-98
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/30/87
ASSESSMENT ID: CRWEQP-3101
NASA FMEA #: TUBE CUTTER 6I
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3101
ITEM: TUBE CUTTER CUTTING WHEEL
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)
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REMARKS:

REPORT DATE 02/12/88 C-99
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/30/87
ASSESSMENT ID: CRWEQP-3102
NASA FMEA #: TUBE CUTTER 6A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3102
ITEM: TUBE CUTTER CUTTING WHEEL SLIDE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

REPORT DATE 02/12/88 C-100
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/30/87
ASSESSMENT ID: CRWEQP-3103
NASA FMEA #: TUBE CUTTER 6F

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3103
ITEM: TUBE CUTTER RATCHET WHEEL (ON SMALL RATCHET)
ASSEMBLY

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

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REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/30/87
ASSESSMENT ID: CRWEQP-3104
NASA FMEA #: TUBE CUTTER 6D

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3104
ITEM: TUBE CUTTER SMALL RATCHET ASSEMBLY DIRECTION
SELECTION TAB

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-102
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3105
NASA FMEA #: TUBE CUTTER 6D
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3105
ITEM: TUBE CUTTER SMALL RATCHET ASSEMBLY DIRECTION SELECTION TAB
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

REPORT DATE 02/12/88 C-103
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3106
NASA FMEA #: TUBE CUTTER 6C

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3106
ITEM: TUBE CUTTER PAWL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REPORT DATE 02/12/88 C-104
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3107
NASA FMEA #: TUBE CUTTER 6J

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3107
ITEM: TUBE CUTTER PAWL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-105
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87  
NASA DATA:  
ASSESSMENT ID: CRWEQP-3108  
BASELINE [ ]  
NASA FMEA #: TUBE CUTTER 6K  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 3108  
ITEM: TUBE CUTTER SPRING-ASSISTED RETENTION ROLLER (ON ROLLER LINK)

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

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REMARKS:

REPORT DATE 02/12/88  
C-106
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3109
NASA FMEA #: TUBE CUTTER 6L

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3109
ITEM: TUBE CUTTER ROLLER LINK

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-107
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3110
NASA FMEA #: NASA DATA:

NASA: BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3110
ITEM: TUBE CUTTER IDLER ROLLER
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. IT SHOULD BE ADDED FOR PURPOSES OF COMPLETENESS AND WILL BE DISCUSSED WITH THE SUBSYSTEM MANAGER EVEN THOUGH THIS IS A NON-CRITICAL FAILURE.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3111
NASA FMEA #: TUBE CUTTER 6B

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3111
ITEM: TUBE CUTTER LARGE RATCHET HANDLE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-109
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3112
NASA FMEA #: TUBE CUTTER 6B
NASA DATA:
BASELINE [ ]
NEW [ X ]
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3112
ITEM: TUBE CUTTER SMALL RATCHET HANDLE
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-110
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3113
NASA FMEA #: TUBE CUTTER 6E

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3113
ITEM: TUBE CUTTER SOFT-TIP SET SCREW

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

REMARKS:

REPORT DATE 02/12/88  C-111
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3200
NASA FMEA #: CENTERLINE LATCH 4E

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3200
ITEM: CENTERLINE LATCH BYPASS TOOL SAFETY RELEASE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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:

REPORT DATE 02/12/88 C-112
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87  
ASSESSMENT ID: CRWEQP-3201  
NASA FMEA #: CENTERLINE LATCH 4D  
SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 3201  
ITEM: CENTERLINE LATCH BYPASS TOOL LATCH  
LEAD ANALYST: L. GRAHAM, S. SINCLAIR  

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

Adequate [ ]
Inadequate [ ]

REMARKS:

REPORT DATE 02/12/88 C-113
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3202
NASA FMEA #: CENTERLINE LATCH 4A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3202
ITEM: CENTERLINE LATCH BYPASS TOOL LATCH

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

REMARKS:
IOA AGREES WITH NASA ASSESSMENT.

REPORT DATE 02/12/88 C-114
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3203
NASA FMEA #: CENTERLINE LATCH 4C

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3203
ITEM:
CENTERLINE LATCH BYPASS TOOL LATCH

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

REMARKS:

REPORT DATE 02/12/88 C-115
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
NASA DATA:
ASSESSMENT ID: CRWEQP-3204
BASELINE
NASA FMEA #: CENTERLINE LATCH 4F
NEW
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3204
ITEM: CENTERLINE LATCH BYPASS TOOL RATCHET WHEEL
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-116
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3205
NASA FMEA #: CENTERLINE LATCH 4E
NASA DATA:
BASELINE
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3205
ITEM: CENTERLINE LATCH BYPASS TOOL RELEASE TRIGGER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88   C-117
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3206
NASA FMEA #: CENTERLINE LATCH 4B
NASA DATA:
BASELINE [ ] NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3206
ITEM: CENTERLINE LATCH BYPASS TOOL RATCHET HANDLE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-118
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3207
NASA FMEA #: CENTERLINE LATCH 4D
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3207
ITEM: CENTERLINE LATCH BYPASS TOOL RELEASE CATCH
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88

C-119
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3208
NASA FMEA #: CENTERLINE LATCH 4D
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3208
ITEM: CENTERLINE LATCH BYPASS TOOL SAFETY RELEASE TAB

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-120
## APPENDIX C
### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/24/87  
**NASA DATA:**  
**ASSESSMENT ID:** CRWEQP-3300  
**BASELINE [ ]**  
**NASA FMEA #:** 3-POINT LATCH 5B  
**NEW [ X ]**  

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 3300  
**ITEM:** 3-POINT LATCH TOOL RATCHET HANDLE  

**LEAD ANALYST:** L. GRAHAM, S. SINCLAIR  

**ASSESSMENT:**  

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

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* CIL RETENTION RATIONALE: (If applicable)  

| ADEQUATE [ ] | INADEQUATE [ ] |

**REMARKS:**

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**REPORT DATE 02/12/88**  
**C-121**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3301
NASA FMEA #: CRWEQP-3301
NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3301
ITEM: 3-POINT LATCH TOOL HOOK

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. SHOULD BE ADDED TO NASA DATA BASE.

REPORT DATE 02/12/88 C-122
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3302
NASA FMEA #: 3-POINT LATCH 5A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3302
ITEM: 3-POINT LATCH TOOL RATCHET WHEEL SELECTOR TAB

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-123
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3303
NASA FMEA #: CENTERLINE LATCH 5A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3303
ITEM: 3-POINT LATCH TOOL RATCHET WHEEL SELECTOR TAB

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

REMARCHES:

REPORT DATE 02/12/88 C-124
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3304
NASA FMEA #: CENTERLINE LATCH 5C

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3304
ITEM: 3-POINT LATCH TOOL RATCHET WHEEL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

REMARKS:

REPORT DATE 02/12/88 C-125
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87 
ASSESSMENT ID: CRWEQP-3305 
NASA FMEA #: 

NASA DATA: 
BASELINE [ ] 
NEW [ ] 

SUBSYSTEM: CREW EQUIPMENT 
MDAC ID: 3305 
ITEM: 3-POINT LATCH TOOL ROLLER SHOE RELEASE HANDLE 
LATCH 

LEAD ANALYST: L. GRAHAM, S. SINCLAIR 

ASSESSMENT:

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

REMARKS: 
NO EQUIVALENT NASA FMEA BUT SHOULD BE ADDED FOR PURPOSES OF COMPLETENESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/24/87
ASSESSMENT ID: CRWEQP-3306
NASA FMEA #: CENTERLINE LATCH 5D

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3306
ITEM: 3-POINT LATCH TOOL ROLLER SHOE RELEASE HANDLE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-127
ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3307
NASA FMEA #: 3-POINT LATCH 5F

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3307
ITEM: 3-POINT LATCH TOOL COMPENSATOR ASSEMBLY

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-128
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-3308
NASA FMEA #: 3-POINT LATCH 5E
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3308
ITEM: 3-POINT LATCH TOOL ROLLER SHOE ASSEMBLY
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

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REMARKS:

REPORT DATE 02/12/88 C-129
**APPENDIX C**

**ASSESSMENT WORKSHEET**

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**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 3400  
**ITEM:** EVA WINCH AND MOUNT ASSEMBLY HOOK  
**LEAD ANALYST:** L. GRAHAM, S. SINCLAIR

**ASSESSMENT:**

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

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

**REMARKS:**

**REPORT DATE 02/12/88**  
**C-130**
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3401
NASA FMEA #: EVA WINCH 3G

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3401
ITEM: EVA WINCH AND MOUNT ASSEMBLY RATCHET HANDLE
CONTROL LEVER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:

REPORT DATE 02/12/88 C-131
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3402
NASA FMEA #: EVA WINCH 3F

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3402
ITEM: EVA WINCH AND MOUNT ASSEMBLY RATCHET HANDLE CONTROL LEVER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FOR PURPOSES OF THIS FMEA, THE RATCHET HANDLE CONTROL LEVER CAN BE CONSIDERED AS A PART OF THE RATCHET ASSEMBLY.

REPORT DATE 02/12/88      C-132
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3403
NASA FMEA #: EVA WINCH 3E
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3403
ITEM: EVA WINCH AND MOUNT ASSEMBLY LARGE CONTROL HANDLE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

CRITICALITY
FLIGHT HDW/FUNC

REDUNDANCY SCREENSITEM
A B C

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

RECOMMENDATIONS: (If different from NASA)

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

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-133
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3404
NASA FMEA #: EVA WINCH 3F

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3404
ITEM: EVA WINCH AND MOUNT ASSEMBLY LARGE CONTROL HANDLE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-134
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEPQ-3405
NASA FMEA #: EVA WINCH 3E

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3405
ITEM: EVA WINCH AND MOUNT RATCHET HANDLE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

REPORT DATE 02/12/88   C-135
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3406
NASA FMEA #: EVA WINCH 3C

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3406
ITEM: EVA WINCH AND MOUNT ASSEMBLY ROPE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-136
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3407
NASA FMEA #: EVA WINCH 3B

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3407
ITEM: EVA WINCH AND MOUNT ASSEMBLY ROPE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-137
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3408
NASA FMEA #: EVA WINCH 3I

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3408
ITEM: EVA WINCH AND MOUNT ASSEMBLY TORQUE LIMITER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

| ADEQUATE | [ ] |
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REMARKS:

REPORT DATE 02/12/88 C-138
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3409
NASA FMEA #: EVA WINCH 3F

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3409
ITEM: EVA WINCH AND MOUNT ASSEMBLY RATCHET WHEEL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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:

REPORT DATE 02/12/88 C-139
APPENDIX C

ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3410
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3410
ITEM: EVA WINCH AND MOUNT ASSEMBLY ROPE ROLLER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA BUT IT SHOULD BE ADDED FOR PURPOSES OF COMPLETENESS.

REPORT DATE 02/12/88 C-140
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3411
NASA FMEA #: BASELINE [ ]
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3411
ITEM: EVA WINCH AND MOUNT ASSEMBLY ROPE ROLLER
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

NASA DATA:
BASELINE [ ]
NEW [ ]

CREW EQUIPMENT 3411
EVA WINCH AND MOUNT ASSEMBLY ROPE ROLLER

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA BUT IT SHOULD BE ADDED FOR PURPOSES OF COMPLETENESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3412
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3412
ITEM: EVA WINCH AND MOUNT ASSEMBLY HANDLE
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA BUT IT SHOULD BE ADDED FOR PURPOSES OF COMPLETENESS.

REPORT DATE 02/12/88 C-142
### APPENDIX C
#### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/22/87  
**NASA DATA:**  
**ASSESSMENT ID:** CRWEQP-3413  
**NASA FMEA #:**  
**BASELINE [ ] NEW [ ]**

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 3413  
**ITEM:** EVA WINCH AND MOUNT ASSEMBLY MOUNTING PLATE ASSEMBLY

**LEAD ANALYST:** L. GRAHAM, S. SINCLAIR

**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:**  
NO EQUIVALENT NASA FMEA BUT IT SHOULD BE ADDED FOR PURPOSES OF COMPLETENESS.

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**REPORT DATE 02/12/88 C-143**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3414
NASA FMEA #: EVA WINCH 3H

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3414
ITEM: EVA WINCH AND MOUNT ASSEMBLY GEARS

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

Adequate [ ]
Inadequate [ ]

REMARKS:

REPORT DATE 02/12/88 C-144
**APPENDIX C**

**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 11/22/87  
**ASSESSMENT ID:** CRWEQP-3415  
**NASA FMEA #:** EVA WINCH 2D

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 3415  
**ITEM:** EVA WINCH AND MOUNT ASSEMBLY GEARS

**LEAD ANALYST:** L. GRAHAM, S. SINCLAIR

**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 02/12/88**  
**C-145**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
NASA DATA:
NASA FMEA #: EVA WINCH 30
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3416
ITEM: EVA WINCH AND MOUNT ASSEMBLY PIP PIN
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS:  (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-146
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-3417
NASA FMEA #: EVA WINCH 3C

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3417
ITEM: EVA WINCH AND MOUNT ASSEMBLY ROPE SPOOL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 MECHANICAL MALFUNCTION CAUSE OF THE NASA FMEA 3C WILL BE DUE TO A MALFUNCTION IN THE ROPE STOOL. THEREFORE, THIS FMEA IS PART OF NASA 3C.

REPORT DATE 02/12/88 C-147
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEPQ-3500
NASA FMEA #: WINCH ADAPTER 1C

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3500
ITEM: EVA WINCH ADAPTER ASSEMBLY ROPE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88

C-148
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
NASA DATA:
ASSESSMENT ID: CRWEPQ-3501
BASELINE [ ]
NASA FMEA #: WINCH ADAPTER 1A
NEW [ X ]
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3501
ITEM: EVA WINCH ADAPTER ASSEMBLY ROPE
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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COMPARE [ ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

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

REMARKS:

REPORT DATE 02/12/88 C-149
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3502
NASA FMEA #: WINCH ADAPTER ID

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3502
ITEM: EVA WINCH ADAPTER ASSEMBLY HOOK

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-150
## APPENDIX C
### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/19/87  
**ASSESSMENT ID:** CRWEQP-3503  
**NASA FMEA #:** WINCH ADAPTER 1E

**NASA DATA:**
- BASELINE [ ]
- NEW [ X ]

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 3503  
**ITEM:** EVA WINCH ADAPTER ASSEMBLY HOOK LATCH

**LEAD ANALYST:** L. GRAHAM, S. SINCLAIR

**ASSESSMENT:**

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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 02/12/88**  
**C-151**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3503A
NASA FMEA #: WINCH ADAPTER 1F
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3503
ITEM: EVA WINCH ADAPTER ASSEMBLY HOOK LATCH

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-152
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3504
NASA FMEA #: WINCH ADAPTER 1B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3504
ITEM: EVA WINCH ADAPTER ASSEMBLY ROPE CAM CLEAT

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

NASA [ 2 /1R ] [ P ] [ P ] [ P ] [ X ] *
IOA [ 2 /1R ] [ P ] [ P ] [ P ] [ X ]

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

RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-153
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3505
NASA FMEA #: WINCH ADAPTER 1A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3505
ITEM: EVA WINCH ADAPTER ASSEMBLY ROPE CAM CLEAT

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-154
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3506
NASA FMEA #: WINCH ADAPTER 1G
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3506
ITEM: EVA WINCH ADAPTER ASSEMBLY ROPE GUIDE PLATE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-155
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3507
NASA FMEA #: 

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3507
ITEM: EVA WINCH ADAPTER ASSEMBLY ROPE ROLLER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. 3/3 RANKING IS A NON-CRITICAL FAILURE, BUT IT SHOULD BE ADDED TO THE NASA DATA BASE FOR COMPLETENESS.

REPORT DATE 02/12/88
C-156
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3508
NASA FMEA #: NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3508
ITEM: EVA WINCH ADAPTER ASSEMBLY ROPE ROLLER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. FAILURE IS A NON-CRITICAL FAILURE BUT SHOULD BE ADDED TO THE NASA DATA BASE FOR COMPLETENESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3509
NASA FMEA #: WINCH ADAPTER 1A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3509
ITEM: EVA WINCH ADAPTER ASSEMBLY ROPE SPOOL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ X ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-158
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-3600
NASA FMEA #: PRD-5B

NASA DATA:
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3600
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY RATCHET HANDLE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS:  (If different from NASA)

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

REMARKS:
IOA AGREES WITH NASA CRITICALITIES. TWO DEVICES ARE FLOWN ON EVERY FLIGHT PLUS RMS JETTISON CAPABILITY MUST BE CONSIDERED AVAILABLE GIVING A HARDWARE CRITICALITY OF "3" INSTEAD OF "2". LOSS OF ALL REDUNDANCY HOWEVER, CAN RESULT IN A LOSS OF CREW AND/OR VEHICLE.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEPQ-3601
NASA FMEA #: PRD-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3601
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY HOOK

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-160
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-3602
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3602
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY HOOK LATCH
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
UPON CLOSER EXAMINATION, IOA FEELS THAT A STRUCTURAL FAILURE OF THE HOOK LATCH IS A NON-CREDIBLE FAILURE AND SHOULD BE ELIMINATED FROM FURTHER CONSIDERATION.

REPORT DATE 02/12/88 C-161
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-3603
NASA FMEA #: PRD-3A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3603
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY HOOK LATCH

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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

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

REMARKS:
DISAGREE WITH NASA CRITICALITY AND MODIFY ORIGINAL IOA CRITICALITY. LATCH HOOK FAILING TO CLOSE WILL CAUSE LOSS OF HOOK FUNCTION. HOWEVER, TWO DEVICES ARE FLOWN ON EACH FLIGHT PLUS RMS JETTISON IS STILL AVAILABLE. SINCE THIS TOOL IS USED ONLY AS AN RMS TIE DOWN DEVICE, THERE ARE SUFFICIENT REDUNDANCIES TO LOWER HARDWARE CRITICALITY TO A "3". THE FUNCTIONAL CRITICALITY REMAINS A 1R SINCE LOSS OF ALL REDUNDANCY CAN RESULT IN THE LOSS OF CREW/VEHICLE.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3604
NASA FMEA #: PRD-5A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3604
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY RATCHET GEAR

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-163
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3605
NASA FMEA #: PRD-5A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3605
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY RATCHET GEAR

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-164
APPENDIX C
ASSESSMENT WORKSHEET

Assessment Date: 12/15/87
Assessment ID: CRWEQP-3606
NASA FMEA #: PRD-1A
NASA Data:
Baseline [ ]
New [ X ]

Subsystem: Crew Equipment
MDAC ID: 3606
Item: Payload Retention Device Assembly, Kevlar Web Strap

Lead Analyst: L. Graham, S. Sinclair

Assessment:

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Recommendations: (If different from NASA)

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

* CIL Retention Rationale: (If applicable)

Adequate [ ]
Inadequate [ ]

Remarks:

Report Date 02/12/88 C-165
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3606A
NASA FMEA #: PRD-1B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3606
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY KEVLAR WEB STRAP

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEAs SPLIT THE ANALYSIS FOR THE KEVLAR STRAPS INTO ONE FOR THE LONG STRAP AND ONE FOR THE SHORT STRAP.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3607
NASA FMEA #: PRD-7

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3607
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY REACTION HANDLE ASSEMBLY

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-167
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3608
NASA FMEA #: PRD-5A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3608
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY RATCHET SHAFT PIN

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
SCREENS ARE NOT REQUIRED FOR A 1/1 CRITICALITY AND SHOULD BE IGNORED UNDER IOA ANALYSIS.

REPORT DATE 02/12/88 C-168
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3609
NASA FMEA #: NASA DATA:
NASA DATA: BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3609
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY WEB ROLLER ASSEMBLY

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. SHOULD BE ADDED FOR COMPLETENESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
NASA DATA:
ASSESSMENT ID: CRWEQP-3610 NASA FMEA #:
NASA FMEA #: BASELINE [ ]
SUBSYSTEM: CREW EQUIPMENT NEW [ ]
MDAC ID: 3610
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY WEB ROLLER ASSEMBLY
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

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

REMARKS:
NO EQUIVALENT NASA FMEA. SHOULD BE ADDED FOR PURPOSES OF COMPLETENESS.

REPORT DATE 02/12/88 C-170
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3611
NASA FMEA #: PRD-4A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3611
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY SPRING STORAGE REEL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
AGREE WITH NASA CRITICALITY. CHANGE IOA TO MATCH NASA.

REPORT DATE 02/12/88 C-171
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3612
NASA FMEA #: PRD-5A

NASA DATA:
BASELINE [ ] NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3612
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY RATCHET LATCH

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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| NASA        | 1/1 |     |     |     |     |
| IOA         | 1/1 |     |     |     |     |

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

RECOMMENDATIONS: (If different from NASA)

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

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ] INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-172
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3613
NASA FMEA #: PRD-5A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3613
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY RATCHET LATCH

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-173
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3614
NASA FMEA #: PRD-5A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3614
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY RATCHET ASSEMBLY RELEASE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-174
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3615
NASA FMEA #: PRD-5B
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3615
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY RATCHET
ASSEMBLY RELEASE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-175
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-3616
NASA FMEA #: PRD-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3616
ITEM: PAYLOAD RETENTION DEVICE ASSEMBLY HOOK/WEB
CONNECT PIN

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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IOA [ 1 /1 ] [ ] [ ] [ ] [ ] [ X ]

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

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

REPORT DATE 02/12/88
C-176
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-3700
NASA FMEA #: EVA CABLE CUTTER 1A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3700
ITEM: EVA CABLE CUTTER
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

Adequate [ ]
Inadequate [ ]

REMARKS:

REPORT DATE 02/12/88  C-177
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87  NASA DATA:
ASSESSMENT ID: CRWEQP-3701  BASELINE [ ]
NASA FMEA #: EVA CABLE CUTTER 1C  NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3701
ITEM: EVA CABLE CUTTER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-178
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-3702
NASA FMEA #: EVA CABLE CUTTER 1B
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3702
ITEM: EVA CABLE CUTTER
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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NASA DATA:
BASELINE [ ]
NEW [X]

RECOMMENDATIONS: (If different from NASA)

[ ] [ ] [ ] [ ] [ ]

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

REMARKS:

REPORT DATE 02/12/88 C-179
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3800
NASA FMEA #: SNATCH BLOCK 2C

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3800
ITEM: SNATCH BLOCK ASSEMBLY HOOK LATCH

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

NASA DATA:
BASELINE [ ]
NEW [ X ]

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

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

REMARKS:
THIS FAILURE IS FOR A HOOK LATCH FAILING TO OPEN (OR JAMMING CLOSED). SINCE THE ITEM IS NOT IN USE AT THE TIME OF THE FAILURE AND ALTERNATE MEANS OF SECURING ARE AVAILABLE, THE 3/3 CRITICALITY IS MORE REALISTIC. THEREFORE, IOA RECOMMEND CHANGING THE CRITICALITY OF THIS ITEM TO THE NASA CRITICALITY.

REPORT DATE 02/12/88 C-180
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3801
NASA FMEA #: SNATCH BLOCK 2F

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3801
ITEM: SNATCH BLOCK ASSEMBLY HOOK SWIVEL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

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

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

REMARKS:

REPORT DATE 02/12/88 C-181
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWQP-3802
NASA FMEA #: SNATCH BLOCK 2D

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3802
ITEM: SNATCH BLOCK ASSEMBLY RIGHT SPRING PLUNGER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

NOTE: NASA FMEA WRITTEN FOR LEFT SPRING PLUNGER. LEFT AND RIGHT PLUNGERS IDENTICAL AND CAN BE GROUPED TOGETHER.

REPORT DATE 02/12/88 C-182
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3802A
NASA FMEA #: SNATCH BLOCK 2E
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3802
ITEM: SNATCH BLOCK ASSEMBLY RIGHT SPRING PLUNGER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

* CIL RETENTION RATIONAL: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

NOTE: NASA FMEA ACTUALLY WRITTEN FOR LEFT SPRING PLUNGER. LEFT AND RIGHT PLUNGERS IDENTICAL.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3803
NASA FMEA #: SNATCH BLOCK 2D

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM:
CREW EQUIPMENT

MDAC ID:
3803

ITEM:
SNATCH BLOCK ASSEMBLY LEFT SPRING PLUNGER

LEAD ANALYST:
L. GRAHAM, S. SINCLAIR

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 02/12/88 C-184
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3803A
NASA FMEA #: SNATCH BLOCK 2D

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3803
ITEM: SNATCH BLOCK ASSEMBLY LEFT SPRING PLUNGER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-185
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3804
NASA FMEA #: 

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3804
ITEM: SNATCH BLOCK ASSEMBLY PULL WIRE BALL END

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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(ADD/DELETE)

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

REMARKS:
NO EQUIVALENT NASA FMEA. A 3/3 CRITICALITY IS A NON-CRITICAL FAILURE, BUT IT SHOULD BE ADDED TO THE NASA DATA BASE FOR COMPLETENESS.

REPORT DATE 02/12/88 C-186
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3805
NASA FMEA #: SNATCH BLOCK 2G

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3805
ITEM: SNATCH BLOCK ASSEMBLY HOOK ASSEMBLY LATCH BLOCK

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-187
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3806
NASA FMEA #: NASA DATA:
BASELINE [ ] NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3806
ITEM: SNATCH BLOCK ASSEMBLY PULLEY WHEEL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

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

REMARKS:
NO EQUIVALENT NASA FMEA, BUT IT SHOULD BE ADDED FOR COMPLETENESS.

REPORT DATE 02/12/88 C-188
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-3807
NASA FMEA #: SNATCH BLOCK 2A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 3807
ITEM: SNATCH BLOCK ASSEMBLY HOOK
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-189
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/21/87
ASSESSMENT ID: CRWEQP-4100
NASA FMEA #: 07-5-ML2-1

ASSESSMENT: CRITICALITY
            FLIGHT HDW/FUNC
            A          B          C

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

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

REMARKS:

REPORT DATE 02/12/88 C-190
ASSessment Worksheet

ASSESSMENT DATE: 12/21/87
ASSESSMENT ID: CRWEQP-4101
NASA FMEA #: 07-5-ML2-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4101
ITEM: TURNBUCKLE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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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 02/12/88 C-191
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-4200
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4200
ITEM: LOCKER REMOVAL TOOL
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
AFTER DISCUSSION WITH NASA, IOA AGREES THAT THIS IS NOT A CREDIBLE FAILURE AND SHOULD BE DELETED.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4300
NASA FMEA #: IFM 1B

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4300
ITEM: IFM BREAKOUT BOX INPUT POWER CONNECTOR
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

REMARKS:

REPORT DATE 02/12/88 C-193
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4301
NASA FMEA #: IFM 1A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4301
ITEM: IFM BREAKOUT BOX INPUT POWER CONNECTOR

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

REMARKS:

REPORT DATE 02/12/88 C-194
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4302
NASA FMEA #: IFM 2D
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4302
ITEM: IFM BREAKOUT BOX AUXILIARY ON/OFF SWITCH (SW1)

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

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

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4303
NASA FMEA #: IFM 2C

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4303
ITEM: IFM BREAKOUT BOX AUXILIARY ON/OFF SWITCH (SW1)

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REPORT DATE 02/12/88 C-196
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4304
NASA FMEA #: IFM 2A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4304
ITEM: IFM BREAKOUT BOX OUTPUT POWER CONNECTOR

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-197
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4305
NASA FMEA #: IFM 2B
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4305
ITEM: IFM BREAKOUT BOX OUTPUT POWER CONNECTOR
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-198
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4306
NASA FMEA #: IFM 3A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4306
ITEM: IFM BREAKOUT BOX FUSE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-199
**APPENDIX C**

**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 11/19/87  
**ASSESSMENT ID:** CRWEQP-4306A  
**NASA FMEA #:** IFM 4A

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 4306  
**ITEM:** IFM BREAKOUT BOX FUSE

**LEAD ANALYST:** L. GRAHAM, S. SINCLAIR

**ASSESSMENT:**

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**NASA DATA:**  
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**NEW [X ]**

**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 02/12/88**  
**C-200**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4307
NASA FMEA #: CRWEQP-4307
NASA DATA: BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4307
ITEM: IFM BREAKOUT BOX FUSE HOLDER
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA BUT EFFECT IS THE SAME AS THE FUSE FAILING OPEN OR OPENING PREMATURELY. BROKEN FUSE HOLDER IS PROBABLY AN UNREALISTIC FAILURE SINCE FUSE CAN BE TAPED IN PLACE. RECOMMEND DELETING THIS FMEA FROM FURTHER CONSIDERATION.

REPORT DATE 02/12/88 C-201
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4308
NASA FMEA #: IFM 3C

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4308
ITEM: IFM BREAKOUT BOX AWG OUTPUT SELECT SWITCH (SW3)

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-202
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4309
NASA FMEA #: IFM 3B
NASA DATA:
BASELINE [ ]
NEW [ X ]
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4309
ITEM: IFM BREAKOUT BOX AWG OUTPUT SELECT SWITCH (SW3)
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-203
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4310
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4310
ITEM: IFM BREAKOUT BOX PIN CONNECTION OUTLET

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. THE IOA FAILURE IS NON-CREDIBLE AND SHOULD BE ELIMINATED FROM FURTHER CONSIDERATION. TO HAVE THE FAILURE OCCUR WOULD REQUIRE UNREALISTIC CHAIN OF EVENTS.
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87  
ASSESSMENT ID: CRWEQP-4311  
NASA FMEA #: IFM 5A  

NASA DATA:  
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 4311  
ITEM: IFM BREAKOUT BOX PIN/WIRE HOLDING BRACKET  

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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CIL RETENTION RATIONALE: (If applicable)

* ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-205
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4312
NASA FMEA #: IFM 4B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4312
ITEM: IFM BREAKOUT BOX VARIABLE VOLTAGE POWER SUPPLY

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

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

RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-206
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4313
NASA FMEA #: IFM 4B

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4313
ITEM: IFM BREAKOUT BOX VARIABLE VOLTAGE POWER SUPPLY

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4313
ITEM: IFM BREAKOUT BOX VARIABLE VOLTAGE POWER SUPPLY

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-207
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4314
NASA FMEA #: IFM 4D

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4314
ITEM: IFM BREAKOUT BOX 28 V/VARIABLE SWITCH (SW2)

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-208
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4315
NASA FMEA #: IFM 4C
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4315
ITEM: IFM BREAKOUT BOX 28 V/VARIABLE SWITCH (SW2)

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-209
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4316
NASA FMEA #: IFM 4E

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4316
ITEM: IFM BREAKOUT BOX AWG OUTPUT SELECT SWITCH (SW4)

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

REMARKS:

REPORT DATE 02/12/88 C-210
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-4317
NASA FMEA #: IFM 4F

NASA DATA:
BASELINE [ ]
NEW [ X ]

NASA FMEA
#:
IFM

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 4317

ITEM:
IFM BREAKOUT BOX AWG OUTPUT SELECT SWITCH (SW4)

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:

REPORT DATE 02/12/88 C-211
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5101
NASA FMEA #: CRWEQP-5101

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5101
ITEM: GALLEY WATER HEATER CIRCUIT BREAKER

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED CIRCUIT BREAKERS TO BE A PART OF THE ORBITER AND DID NOT INCLUDE THEIR FAILURE MODES IN THE ANALYSIS OF THE GALLEY.

REPORT DATE 02/12/88
C-212
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5102
NASA FMEA #: 2.1.1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5102
ITEM: GALLEY DC POWER BUS B SWITCH

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-213
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5103
NASA FMEA #: 2.1.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5103
ITEM: GALLEY DC POWER BUS B SWITCH

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-214
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5104
NASA FMEA #: 

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5104
ITEM: GALLEY DC POWER BUS B SWITCH

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

REMARKS:
NASA DOES NOT FEEL THIS IS A CREDIBLE FAILURE MODE FOR THIS TYPE OF SWITCH. IOA FMEA 5104 WILL BE CANCELLED.

REPORT DATE 02/12/88  C-215
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5105
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT BASELINE [ ]
MDAC ID: 5105 NEW [ ]
ITEM: POTABLE WATER HEATER TELEMETRY
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

ERRONEOUS OUTPUT OF THE TELEMETRY WILL HAVE NO EFFECT ON THE
ACTUAL OPERATION OF THE GALLEY. THIS FAILURE WAS NOT INCLUDED IN
NASA'S ANALYSIS.

REPORT DATE 02/12/88 C-216
### APPENDIX C
#### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 12/01/87  
**ASSESSMENT ID:** CRWEQP-5106  
**NASA FMEA #:** 1.4.1  
**NASA DATA:** BASELINE [ ]  
**NEW [ X ]**  

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 5106  
**ITEM:** RECIRCULATION PUMP  

**LEAD ANALYST:** S.K. SINCLAIR

**ASSESSMENT:**

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

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

**REMARKS:**

---

**REPORT DATE 02/12/88**  
**C-217**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5107
NASA FMEA #: 
NASA DATA: 
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5107
ITEM: RECIRCULATION PUMP

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

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

REMARKS:
FAILURE OF P1 TO STOP WAS NOT CONSIDERED TO BE A SIGNIFICANT FAILURE TO NASA AND WAS NOT INCLUDED IN THEIR ANALYSIS.

REPORT DATE 02/12/88 C-218
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87  NASA DATA:  
ASSESSMENT ID: CRWEQP-5108  BASELINE [ ]  
NASA FMEA #: 2.13.1  NEW [ x ]  
SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 5108  
ITEM: RECIRCULATION THERMOSTAT  
LEAD ANALYST: S.K. SINCLAIR  

ASSESSMENT:

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

ADEQUATE [ ]  
INADEQUATE [ ]  

REMARKS:
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87  
ASSESSMENT ID: CRWEQP-5109  
NASA FMEA #: 2.13.2

NASA DATA:  
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5109
ITEM: RECIRCULATION THERMOSTAT

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  
C-220
**APPENDIX C**  
**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 12/01/87  
**ASSESSMENT ID:** CRWEQP-5110  
**NASA FMEA #:** 1.3.3  
**NASA DATA:**  
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**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 5110  
**ITEM:** HOT WATER TANK  
**LEAD ANALYST:** S.K. SINCLAIR

**ASSESSMENT:**

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

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

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**REMARKS:**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5111
NASA FMEA #: 2.9.1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5111
ITEM: WATER TANK HEATERS

LEAD ANALYST: S.K. SINCLAIR

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 02/12/88 C-222
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5112
NASA FMEA #: 2.10.1
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5112
ITEM: WATER TANK HEATERS
LEAD ANALYST: S.K. SINCLAIR

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:
THIS FAILURE HAS THE SAME RESULTS NASA 2.10.1 - WATER HEATER THERMOSTATS FAIL ON.
**APPENDIX C**
**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 12/01/87  
**NASA DATA:**  
**ASSESSMENT ID:** CRWEQP-5113  
**NASA FMEA #:** 2.10.1  
**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 5113  
**ITEM:** WATER TANK HEATER THERMOSTAT  
**LEAD ANALYST:** S.K. SINCLAIR

**ASSESSMENT:**

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

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* CIL RETENTION RATIONALE: (If applicable)

| ADEQUATE | [ ] |
| INADEQUATE | [ ] |

**REMARKS:**

**REPORT DATE 02/12/88**  
C-224
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5114
NASA FMEA #: 2.10.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5114
ITEM: WATER TANK HEATER THERMOSTAT

LEAD ANALYST: S.K. SINCLAIR

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 02/12/88 C-225
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5115
NASA FMEA #: 1.15.1

NASA DATA:
BASELINE [ ]
NEW [ x ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5115
ITEM: HOT WATER TEMPERATURE GAUGE

LEAD ANALYST: S.K. SINCLAIR

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 02/12/88 C-226
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5116
NASA FMEA #: CRWEQP-5116

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5116
ITEM: GALLEY OVEN CIRCUIT BREAKER

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED CIRCUIT BREAKERS TO BE A PART OF THE ORBITER AND DID NOT INCLUDE THEIR FAILURE MODES IN THE ANALYSIS OF THE GALLEY.

REPORT DATE 02/12/88 C-227
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
NASA DATA:
ASSESSMENT ID: CRWQEP-5117
NASA FMEA #: 2.2.1
SUBSYSTEM: CREW EQUIPMENT
NASA DATA:
BASELINE [ ]
NEW [ X ]
MDAC ID: 5117
ITEM: GALLEY DC POWER BUS A SWITCH
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-228
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5118
NASA FMEA #: 2.2.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5118
ITEM: GALLEY DC POWER BUS A SWITCH

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:

REPORT DATE 02/12/88 C-229
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5119
NASA FMEA #: CRWEQP-5119

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5119
ITEM: GALLEY DC POWER BUS A SWITCH

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

NASA DOES NOT CONSIDER A PARTIAL OUTPUT TO BE A CREDIBLE FAILURE FOR THIS TYPE OF SWITCH. THIS FMEA (5119) WILL DELETED.

REPORT DATE 02/12/88 C-230
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5120
NASA FMEA #: 

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5120
ITEM: FOOD OVEN TELEMETRY

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ERRONEOUS OUTPUT OF THE TELEMETRY WAS NOT CONSIDERED BY NASA TO BE A SIGNIFICANT FAILURE AND WAS NOT INCLUDED IN THEIR ANALYSIS.

REPORT DATE 02/12/88 C-231
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5121
NASA FMEA #:
NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5121
ITEM: GALLEY FAN CIRCUIT BREAKERS

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

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

REMARKS:
NASA CONSIDERED CIRCUIT BREAKERS TO BE A PART OF THE ORBITER AND DID NOT INCLUDE THEIR FAILURES IN THE ANALYSIS OF THE GALLEY.

REPORT DATE 02/12/88    C-232
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5122
NASA FMEA #: 2.3.1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5122
ITEM: GALLEY OVEN FAN SWITCH

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-233
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87  NASA DATA:
ASSESSMENT ID: CRWEQP-5123  BASELINE [ ]
NASA FMEA #: 2.3.2  NEW [ X ]
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5123
ITEM: GALLEY OVEN FAN SWITCH
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS:  (If different from NASA)

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* CIL RETENTION RATIONALE:  (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-234
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5124
NASA FMEA #: 2.8.1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5124
ITEM: OVEN FAN - MOTOR

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-235
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5125
NASA FMEA #: 2.8.1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5125
ITEM: OVEN FAN - MOTOR

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-236
ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5126
NASA FMEA #: 2.8.1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5126
ITEM: OVEN FAN - MOTOR

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-237
**APPENDIX C**  
**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 12/01/87  
**ASSESSMENT ID:** CRWEQP-5127  
**NASA FMEA #:** 2.8.2

**NASA DATA:**  
BASELINE [ ]  
NEW [ X ]

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 5127  
**ITEM:** OVEN FAN

**LEAD ANALYST:** B. RICHARD

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

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]  
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**REMARKS:**

**REPORT DATE** 02/12/88  
**C-238**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5128
NASA FMEA #: 2.12.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5128
ITEM: OVEN THERMOSTAT

LEAD ANALYST: B. RICHARD

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

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-239
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5129
NASA FMEA #: 2.12.1
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5129
ITEM: OVEN THERMOSTAT
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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(REMEDIATION) [ ]

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-240
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5130
NASA FMEA #: 2.11.1

NASA DATA:
BAELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5130
ITEM: OVEN HEATER

LEAD ANALYST: B. RICHARD

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

REMARKS:

REPORT DATE 02/12/88 C-241
### APPENDIX C
#### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 12/01/87  
**NASA DATA:**  
**ASSESSMENT ID:** CRWEQP-5131  
**BASELINE [ ]**  
**NASA FMEA #:**  
**NEW [ ]**  

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 5131  
**ITEM:** OVEN DOOR LAUNCH/ENTRY RESTRAINING STRAP  

**LEAD ANALYST:** B. RICHARD

**ASSESSMENT:**

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

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(ADD/DELETE)

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

ADEQUATE [ ]

INADEQUATE [ ]

**REMARKS:**

NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5132
NASA FMEA #: NASA DATA:

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5132
ITEM: OVEN DOOR
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

NASA considered this component as secondary structure and therefore did not analyze it for failures.

REPORT DATE 02/12/88 C-243
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5133
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5133
ITEM: OVEN DOOR

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.

REPORT DATE 02/12/88 C-244
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5134
NASA FMEA #: 

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5134
ITEM: OVEN DOOR LATCH
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.

REPORT DATE 02/12/88 C-245
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5135
NASA FMEA #: NASA DATA:

NASA DATA: BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5135
ITEM: OVEN DOOR LATCH

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5136
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT NASA DATA:
MDAC ID: 5136 BASELINE [ ]
ITEM: OVEN DOOR TRACK NEW [ ]
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87  
ASSESSMENT ID: CRWEQP-5137  
NASA ID: CRWEQP-5137  
NASA FMEA #:  

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 5137  
ITEM: OVEN DOOR TRACK  
LEAD ANALYST: B. RICHARD  

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RECOMMENDATIONS:  (If different from NASA)

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* CIL RETENTION RATIONALE:  (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5138
NASA FMEA #: 
NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5138
ITEM: OVEN GASKET
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA DID NOT CONSIDER THIS TO BE A SIGNIFICANT FAILURE AND THEREFORE DID NOT INCLUDE IT IN THEIR ANALYSIS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5139
NASA FMEA #: NASA DATA:

BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5139
ITEM: OVEN SHELF ASSEMBLY - UPPER RACK

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.

REPORT DATE 02/12/88 C-250
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5140
NASA FMEA #: NASA FMEA
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5140
ITEM: LOWER SHELF ASSEMBLY
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5141
NASA FMEA #: NASA DATA:

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SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5141
ITEM: LOWER TRACKS

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5142
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT BASELINE [ ]
MDAC ID: 5142 NEW [ ]
ITEM: OVEN SCREEN
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

SINCE THE SCREEN CAN BE CLEANED, THIS IS NOT CONSIDERED A CREDIBLE FAILURE BY NASA. THIS FMEA (5142) WILL BE DELETED.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5143
NASA FMEA #: NASA DATA:

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5143
ITEM: OVEN SCREEN
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
COMPARE [ N /N ] [ ] [ ] [ ] [ ] [ ]

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

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5144
NASA FMEA #: 

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5144
ITEM: SPRING LOADED PLATE

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5145
NASA FMEA #: NASA DATA:

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5145
ITEM: OVEN SPRING CLIP
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEOQP-5146
NASA FMEA #: NASA DATA:

NASA ID:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5146
ITEM: OVEN FINNED PLATE HEAT SINK

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

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

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.

REPORT DATE 02/12/88 C-257
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5147
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5147
ITEM: GALLEY CONTROL ELECTRONICS
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS WAS NOT CONSIDERED TO BE A CREDIBLE FAILURE BY NASA; ALSO ASSOCIATED FAILURES ARE COVERED BY OTHER FMEAs ON INDIVIDUAL SWITCHES. THIS FMEA (5147) WILL BE DELETED.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5148
NASA FMEA #: 2.7.1, 2.7.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5148
ITEM: WATER QUANTITY SELECTOR SWITCH

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

(ADD/DELETE)

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

REMARKS:
THIS FAILURE IS COVERED BY NASA FMEAs 2.7.1 AND 2.7.2.

REPORT DATE 02/12/88 C-259
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASNSESSMENT ID: CRWEQP-5149
NASA FMEA #: 2.7.2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5149
ITEM: WATER QUANTITY SELECTOR SWITCH

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-260
**APPENDIX C**

**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 12/01/87  
**NASA DATA:**  
**BASELINE** [ ]  
**NEW** [ X ]

**ASSESSMENT ID:** CRWEQP-5150  
**MDAC ID:** 5150  
**ITEM:** WATER QUANTITY SELECTOR SWITCH

**LEAD ANALYST:** B. RICHARD

**SUBSYSTEM:** CREW EQUIPMENT

**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 02/12/88**  
**C-261**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5151
NASA FMEA #: NASA FMEA

ASSIGNMENT ID: NASA FMEA
MDAC ID: CREW EQUIPMENT
ITEM: REHYDRATION PUMP

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FAILURE OF P2 TO STOP WAS NOT CONSIDERED TO BE A SIGNIFICANT FAILURE TO NASA AND WAS NOT INCLUDED IN THEIR ANALYSIS.

REPORT DATE 02/12/88 C-262
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5152
NASA FMEA #: 1.5.1
NASA ID: CRWEQP-5152
NASA FMEA #: 1.5.1
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5152
ITEM: REHYDRATION PUMP
LEAD ANALYST: B. RICHARD

ASSESSMENT:

CRITICALITY
FLIGHT
HDW/FUNC

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

REDUNDANCY SCREENS
A B C

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

CIL ITEM
[ ] *
[ ] [ ]
[ ] [ ]

RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-263
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5153
NASA FMEA #: 2.4.2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5153
ITEM: RHS LEVER ARM CONTROL

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FAILURE OF THIS SWITCH OPEN COULD RESULT IN LOSS OF THE GALLEY.
A DIFFERENCE IN GROUND RULES ACCOUNTS FOR THE DIFFERENCE IN CRITICALITY RATINGS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5154
NASA FMEA #: 2.4.1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5154
ITEM: RHS LEVER ARM CONTROL

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

REMARKS:
A DIFFERENCE IN GROUNDRULES ACCOUNTS FOR THE SLIGHT DIFFERENCE IN CRITICALITY RATINGS.

REPORT DATE 02/12/88    C-265
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5155
NASA FMEA #: 2.4.1
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5155
ITEM: REHYDRATION STATION SWITCH
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A DIFFERENCE IN GROUNDRULES ACCOUNTS FOR THE SLIGHT DIFFERENCE IN THE CRITICALITY RATINGS.

REPORT DATE 02/12/88    C-266
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5156
NASA FMEA #: 2.4.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5156
ITEM: REHYDRATION STATION SWITCH

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

REMARKS:
A DIFFERENCE IN GROUNDRULES ACCOUNTS FOR THE SLIGHT DIFFERENCE IN THE CRITICALITY RATINGS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5157
NASA FMEA #: 2.6.1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5157
ITEM: COLD WATER FILL PUSH BUTTON SWITCH

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5158
NASA FMEA #: 2.6.2

NASA DATA:
BASELINE [ ]
NEW [ x ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5158
ITEM: COLD WATER FILL PUSH BUTTON SWITCH

LEAD ANALYST: B. RICHARD

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 02/12/88 C-269
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5159
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT NASA BASELINE [ ]
MDAC ID: 5159 NEW [ ]
ITEM: COLD WATER FILL SWITCH - LIGHT

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA DID NOT CONSIDER THIS FAILURE SIGNIFICANT AND DID NOT INCLUDE IT IN THEIR ANALYSIS.

REPORT DATE 02/12/88 C-270
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5160
NASA FMEA #: CRWEQP-5160
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5160
ITEM: COLD WATER FILL SWITCH - LIGHT
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

NASA DID NOT CONSIDER THIS FAILURE SIGNIFICANT AND DID NOT INCLUDE IT IN THEIR ANALYSIS.

REPORT DATE 02/12/88 C-271
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5161
NASA FMEA #: 1.9.2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5161
ITEM: RHS CHILLED WATER FEED SOLENOID/VALVE

LEAD ANALYST: B. RICHARD

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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 02/12/88  C-272
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5162
NASA FMEA #: 1.9.1
NASA DATA:
   BASELINE [   ]
   NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5162
ITEM: RHS CHILLED WATER FEED SOLENOID/VALVE

LEAD ANALYST: B. RICHARD

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:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5163
NASA FMEA #: 1.8.2
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5163
ITEM: RHS OUTLET SOLENOID VALVE
LEAD ANALYST: B. RICHARD
NASA DATA:
BASELINE [ ]
NEW [ X ]

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-274
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5164
NASA FMEA #: 1.8.1
NASA DATA: BASELINE [ ] NEW [ X ]
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5164
ITEM: RHS OUTLET SOLENOID VALVE
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A DIFFERENCE IN GROUNDRULES ACCOUNTS FOR THE SLIGHT DIFFERENCE IN CRITICALITY RATINGS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5165
NASA FMEA #: 1.7.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5165
ITEM: RHS BYPASS SOLENOID VALVE

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

REPORT DATE 02/12/88 C-276
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5166
NASA FMEA #: 1.7.1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5166
ITEM: RHS BYPASS SOLENOID VALVE

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
A DIFFERENCE IN GROUNDRULES ACCOUNTS FOR THE SLIGHT DIFFERENCE IN THE CRITICALITY RATINGS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5167
NASA FMEA #: 2.5.1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5167
ITEM: HOT WATER FILL PUSH BUTTON SWITCH

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5168
NASA FMEA #: 2.5.2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5168
ITEM: HOT WATER FILL PUSH BUTTON SWITCH

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-279
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5169
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT NASA FMEA
MDAC ID: 5169 BASELINE [ ]
ITEM: HOT WATER FILL SWITCH - LIGHT NEW [ ]
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
NASA DID NOT CONSIDER THIS FAILURE SIGNIFICANT AND DID NOT INCLUDE IT IN THEIR ANALYSIS.

REPORT DATE 02/12/88 C-280
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5170
NASA FMEA #: 
NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5170
ITEM: HOT WATER FILL SWITCH - LIGHT

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA DID NOT CONSIDER THIS FAILURE SIGNIFICANT AND DID NOT INCLUDE IT IN THEIR ANALYSIS.
## APPENDIX C

### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 12/01/87  
**ASSESSMENT ID:** CRWEQP-5171  
**NASA FMEA #:** 1.6.2

### NASA DATA:
- **BASELINE** [   ]  
- **NEW** [ X ]

**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 5171  
**ITEM:** COLD WATER RECIRCULATION SOLENOID/VALVE

**LEAD ANALYST:** B. RICHARD

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

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

**ADEQUATE** [ ]

**INADEQUATE** [ ]

### REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5172
NASA FMEA #: 1.6.1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5172
ITEM: COLD WATER RECIRCULATION SOLENOID/VALVE

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5173
NASA FMEA #: 1.14.1

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5173
ITEM: RHS NEEDLE

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A DIFFERENCE IN GROUNDRULES ACCOUNTS FOR THE SLIGHT DIFFERENCE IN THE CRITICALITY RATINGS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5174
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5174
ITEM: RHS CUP RETAINER

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

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

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.

REPORT DATE 02/12/88 C-285
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87  NASA DATA:
ASSESSMENT ID: CRWEQP-5175  BASELINE [ ]
NASA FMEA #:  NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5175
ITEM: RHS CUP RETAINER PARALLEL RODS

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

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

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURE.

REPORT DATE 02/12/88  C-286
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5176
NASA FMEA #: NASA DATA:
BASELINE [ ] NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5176
ITEM: RHS CUP RETAINER PARALLEL RODS

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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*(ADD/DELETE)*

*CIL RETENTION RATIONALE: (If applicable)*

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.

REPORT DATE 02/12/88 C-287
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEPQ-5177
NASA FMEA #: NASA DATA: BASELINE [ ] NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5177
ITEM: RHS "TRANSPARENT CHAMBER"

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA CONSIDERED THIS COMPONENT AS SECONDARY STRUCTURE AND THEREFORE DID NOT ANALYZE IT FOR FAILURES.

REPORT DATE 02/12/88 C-288
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5178
NASA FMEA #: 1.2.2

NASA DATA:
BASELINE [  ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5178
ITEM: INLET WATER CONNECTIONS

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

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

REMARKS:
A DIFFERENCE IN GROUNDRULES ACCOUNTS FOR THE SLIGHT DIFFERENCE IN THE CRITICALITY RATINGS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5179
NASA FMEA #: 1.2.1, 1.2.3
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5179
ITEM: INLET WATER CONNECTIONS
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-290
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87
ASSESSMENT ID: CRWEQP-5180
NASA FMEA #: 1.1.1

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5180
ITEM: MANUAL SHUT OFF VALVE

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

REMARKS:
A DIFFERENCE IN GROUNDRULES ACCOUNTS FOR THE SLIGHT DIFFERENCE IN CRITICALITY RATINGS.

REPORT DATE 02/12/88 C-291
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/01/87  
ASSESSMENT ID: CRWEQP-5181  
NASA FMEA #:  
SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 5181  
ITEM: AUXILIARY PORT - POTABLE WATER  
LEAD ANALYST: B. RICHARD

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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 OF THE AUXILIARY PORT WAS NOT CONSIDERED BY NASA IN THEIR ANALYSIS OF THE GALLEY.

REPORT DATE 02/12/88  
C-292
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5300
NASA FMEA #: OWDA-10A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5300
ITEM: OPERATIONAL WATER DISPENSER QUICK DISCONNECTS

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

REMARKS:
THE QUICK DISCONNECTS ARE A SUB-PART OF THE HOSE ASSEMBLY REFERENCED IN THE NASA FMEA.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5301
NASA FMEA #: OWDA-10A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5301
ITEM: OPERATIONAL WATER DISPENSER QUICK DISCONNECTS

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

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

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

REMARKS:
THE QUICK DISCONNECTS ARE A SUB-PART OF THE HOSE ASSEMBLY REFERENCED IN THE NASA FMEA.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5302
NASA PMEA #: OWDA-6A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5302
ITEM: OPERATIONAL WATER DISPENSER AMBIENT/CHILLED/OFF WATER VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-295
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5303
NASA FMEA #: OWDA-6D

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5303
ITEM: OPERATIONAL WATER DISPENSER AMBIENT/CHILLED/OFF WATER VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
The IOA FMEA CARRIES THE OVERALL FAILURE MODE OF EXTERNAL LEAKAGE, BUT DESCRIBES THE EFFECTS OF NASA FMEA OWDA-6D - FAILS OPEN/INTERNAL LEAKAGE.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5304
NASA FMEA #: OWDA-6B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5304
ITEM: OPERATIONAL WATER DISPENSER AMBIENT/CHILLED/OFF
WATER VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
AGREE WITH NASA CRITICALITY. HAVING WATER AVAILABLE AT ONLY ONE TEMPERATURE SHOULD NOT CAUSE A MISSION ABORT.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5305
NASA FMEA #: OWDA-4B
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5305
ITEM: OPERATIONAL WATER DISPENSER PRESSURE REGULATOR
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-298
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5306
NASA FMEA #: OWDA-4C

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5306
ITEM: OPERATIONAL WATER DISPENSER PRESSURE REGULATOR

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

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:

NASA FMEA DOES NOT CONSIDER THE POSSIBILITY THAT THE LEAKAGE WILL
RENDER THE PRESSURE REGULATOR AND THUS THE OWDA INOPERABLE. IF
THE LEAK IS SMALL, THE OWDA IS USABLE. HOWEVER, A LARGE LEAK
WILL DECREASE THE PRESSURE AND PREVENT WATER FROM REACHING
THE CREW. THE ISSUE WILL BE DISCUSSED WITH THE SUBSYSTEM
MANAGER.

REPORT DATE 02/12/88 C-299
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5307
NASA FMEA #: OWDA-5A

NASA DATA:
BASELINE [ ]
NEW [ x ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5307
ITEM: OPERATIONAL WATER DISPENSER BYPASS VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-300
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5308
NASA FMEA #: OWDA-5B
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5308
ITEM: OPERATIONAL WATER DISPENSER BYPASS VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

REMARKS:
IOA FMEA 5308 LISTS AN OVERALL FAILURE MODE OF EXTERNAL LEAKAGE, BUT DESCRIBES THE EFFECTS TO MATCH NASA FMEA OWDA-5B - FAILS OPEN/INTERNAL LEAKAGE.

REPORT DATE 02/12/88 C-301
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5309
NASA FMEA #: OWDA-3B

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5309
ITEM: OPERATIONAL WATER DISPENSER SOLENOID VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-302
APPENDIX C  
ASSESSMENT WORKSHEET  

ASSESSMENT DATE: 12/02/87  
ASSESSMENT ID: CRWEQP-5310  
NASA FMEA #: OWDA-3A  

NASA DATA:  
BASELINE [ ]  
NEW [ X ]  

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 5310  
ITEM: OPERATIONAL WATER DISPENSER SOLENOID VALVE  

LEAD ANALYST: L. GRAHAM, S. SINCLAIR  

ASSESSMENT:  

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

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

REMARKS:  
IOA FMEA IS TITLED WITH A FAILURE MODE OF EXTERNAL LEAKAGE. HOWEVER, THE EFFECTS DESCRIBE THE CASE OF FAILING OPEN/LEAKS INTERNALLY AS WRITTEN IN THE NASA FMEA.  

REPORT DATE 02/12/88 C-303
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5311
NASA FMEA #: OWDA-11A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5311
ITEM: OPERATIONAL WATER DISPENSER ROTARY SELECTION SWITCH

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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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 02/12/88 C-304
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5312
NASA FMEA #: OWDA-2C

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5312
ITEM: OPERATIONAL WATER DISPENSER REHYDRATION NEEDLE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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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 02/12/88 C-305
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-5313
NASA FMEA #: NASA DATA:
NASA ID: CRWEQP-5313 BASELINE [ ]
NASA FMEA #: NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5313
ITEM: OPERATIONAL WATER DISPENSER MICROBIAL CHECK VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO EQUIVALENT NASA FMEA. SHOULD BE ADDED TO NASA DATA BASE FOR COMPLETENESS.
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5314
NASA FMEA #: OWDA-7A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5314
ITEM: OPERATIONAL WATER DISPENSER MICROBIAL CHECK
VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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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 02/12/88  C-307
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-5315
NASA FMEA #: NASA DATA: Baseline [ ] New [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5315
ITEM: OPERATIONAL WATER DISPENSER MICROBIAL CHECK VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO COMPARABLE NASA FMEA. UPON CLOSER EXAMINATION IOA FEELS THAT THIS FAILURE IS UNREALISTIC AND SHOULD BE DELETED FROM THE IOA DATA BASE.

REPORT DATE 02/12/88 C-308
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5316
NASA FMEA #: OWDA-8A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5316
ITEM: OPERATIONAL WATER DISPENSER PERSONAL HYGIENE VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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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 02/12/88 C-309
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5317
NASA FMEA #: OWDA-8B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5317
ITEM: OPERATIONAL WATER DISPENSER PERSONAL HYGIENE VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

<p>| CRITICALITY | REDUNDANCY SCREENS | CIL |</p>
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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 02/12/88 C-310
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5318
NASA FMEA #: OWDA-8A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5318
ITEM: OPERATIONAL WATER DISPENSER PERSONAL HYGIENE VALVE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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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 02/12/88 C-311
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5319
NASA FMEA #: CRWEQP-5319

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5319
ITEM: OPERATIONAL WATER DISPENSER HOLDING CLIPS

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

REMARKS:
NO EQUIVALENT NASA FMEA BUT IT SHOULD BE ADDED FOR COMPLETENESS.

REPORT DATE 02/12/88 C-312
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5320
NASA FMEA #: OWDA-14A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5320
ITEM: OPERATIONAL WATER DISPENSER INPUT POWER
CONNECTOR

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 INPUT POWER CONNECTOR IS A SUB-PART OF THE OVERALL OWDA CONTROLLER. CRITICALITY SHOULD BE CHANGED TO MATCH NASAs SINCE LOSS OF ALL REDUNDANT METHODS TO PROVIDE WATER TO THE CREW WILL RESULT IN A LOSS OF MISSION.

REPORT DATE 02/12/88 C-313
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5321
NASA FMEA #: OWDA-9A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5321
ITEM: OPERATIONAL WATER DISPENSER FLEX LINE

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

THE NASA FMEA IS ACTUALLY WRITTEN FOR A LEAKAGE IN THE LINE. A LEAK, IF TAKEN TO WORST CASE, CAN BE CONSIDERED A STRUCTURAL FAILURE.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-5322
NASA FMEA #: OWDA-9B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5322
ITEM: OPERATIONAL WATER DISPENSER FLEX LINES

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:

REPORT DATE 02/12/88 C-315
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-5400
NASA FMEA #: CWDA-15A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5400
ITEM: CONTINGENCY WATER DISPENSER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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

NASA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ] *
IOA [ 3 /2R ] [ P ] [ P ] [ P ] [ ]
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:
NASA FMEA DOES NOT CONSIDER THE POSSIBILITY THAT THE LEAK CAN BE SEVERE ENOUGH TO PREVENT THE USE OF THE CWDA. SINCE WORST CASE ANALYSIS REQUIRES THAT THIS BE DONE, IOA RECOMMENDS THAT THE CRITICALITY BE CHANGED TO A 3/2R.

REPORT DATE 02/12/88 C-316
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/04/87
ASSESSMENT ID: CRWEQP-5400A
NASA FMEA #: CWDA-17B
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5400
ITEM: CONTINGENCY WATER DISPENSER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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IOA [ 3 /2R ] [ P ] [ P ] [ P ] [ ]
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:
NASA FMEA DOES NOT CONSIDER THE POSSIBILITY THAT THE LEAK CAN BE SEVERE ENOUGH TO PREVENT THE USE OF THE CWDA. A WORST CASE LEAK WOULD DO THIS. IOA RECOMMENDS THAT ASSIGNING THE 3/2R CRITICALITY TO THE CWDA CONNECTION.

REPORT DATE 02/12/88 C-317
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-5401
NASA FMEA #: CWDA-15B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5401
ITEM: CONTINGENCY WATER DISPENSER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-318
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-5402
NASA FMEA #: CWDA-16A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 5402
ITEM: CONTINGENCY WATER DISPENSER

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
AGREE WITH NASA CRITICALITIES.

REPORT DATE 02/12/88 C-319
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6100
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6100
ITEM: SLEEPING BAG - ADJUSTABLE STRAPS
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA DID NOT CONSIDER THIS FAILURE SIGNIFICANT AND DID NOT INCLUDE IT IN THEIR ANALYSIS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6101
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT NASA DATA:
MDAC ID: 6101 BASELINE [ ]
ITEM: SLEEPING BAG - HELICAL SPRING NEW [ ]
LEAD ANALYST: S.K. SINCLAIR

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:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-321
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6102
NASA FMEA #: BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6102
ITEM: SLEEPING BAG - CLOTH TUNNEL

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-322
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6103
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT BASELINE [ ]
MDAC ID: 6103 NEW [ ]
ITEM: SLEEPING BAG - SPRING CLIP

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-323
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6104
NASA FMEA #: CRWEQP-6104
NASA FMEA #: CRWEQP-6104
ASSESSMENT ID: CRWEQP-6104
NASA DATA: BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6104
ITEM: SLEEPING BAG - SPRING CLIP

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-324
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6105
NASA FMEA #: NASA DATA:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6105
ITEM: SLEEPING BAG - PIP PIN

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-325
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6106
NASA FMEA #: NASA DATA:
BASELINE [ ] NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6106
ITEM: SLEEPING BAG - MOUNTING LOCATION

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

| CRITICALITY | REDUNDANCY SCREENS | CIL |
| HDW/FUNC | A | B | C | ITEM |
| NASA | [ / ] | [ ] | [ ] | [ ] | [ ] | [ ] |
| IOA | [ 3 /3 ] | [ ] | [ ] | [ ] | [ ] | [ ] |
| COMPARE | [ N /N ] | [ ] | [ ] | [ ] | [ ] | [ ] |

RECOMMENDATIONS: (If different from NASA)

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

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-326
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88  NASA DATA:
ASSESSMENT ID: CRWEQP-6107  BASELINE [ ]
NASA FMEA #:  NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6107
ITEM: SLEEPING BAG RESTRAINTS - BUCKLE FLAP

LEAD ANALYST: S.K. SINCLAIR

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IOA [ 3 /3 ] [ ] [ ] [ ] [ ] [ ]
COMPARE [ N /N ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

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

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-327
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6108
NASA FMEA #: CRWEQP-6108
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6108
ITEM: ATTACHMENT ZIPPER(S)

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-328
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88  ASSESSMENT ID: CRWEQP-6109  NASA DATA:
NASA FMEA #:  BASELINE [ ]  NEW [ ]

SUBSYSTEM: CREW EQUIPMENT  NASA [ ] [ ] [ ]
MDAC ID: 6109  IOA [3/3] [ ] [ ]
ITEM: CLOSURE ZIPPER  COMPARE [N/N] [ ] [ ] [ ]

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88  C-329
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6110
NASA FMEA #: NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6110
ITEM: BODY RESTRAINTS

LEAD ANALYST: S.K. SINCLAIR

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:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6111
NASA FMEA #:
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6111
ITEM: FOUR-TIER SLEEP STATION SLIDING DOOR
LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:
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REPORT DATE 02/12/88 C-331
APPENDIX C
ASSESSMENT WORKSHEET

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| SUBSYSTEM: CREW EQUIPMENT | |
|---------------------------| |
| MDAC ID: 6112 | |
| ITEM: FOUR-TIER SLEEP STATION CAPTIVE WING NUT FASTENER | |

| LEAD ANALYST: H. SAXON | |

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

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| INADEQUATE | |

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REPORT DATE 02/12/88 C-332
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6113
NASA FMEA #: CRWEQP-6113
NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6113
ITEM: FOUR-TIER SLEEP STATION AIR DIFFUSER

LEAD ANALYST: H. Saxon

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-333
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/14/88
ASSESSMENT ID: CRWEQP-6114
NASA FMEA #: NASA DATA:
SUBSYSTEM: CREW EQUIPMENT NASA DATA: BASELINE [ ]
MDAC ID: 6114 NEW [ ]
ITEM: FOUR-TIER SLEEP STATION LIGHT
LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DATA WAS NOT AVAILABLE FROM NASA FOR THIS ASSESSMENT.

REPORT DATE 02/12/88 C-334
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/09/87  
ASSESSMENT ID: CRWEQP-6200  
NASA FMEA #: PIP PIN (1) A

NASA DATA:  
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 6200  
ITEM: ORBITER SIDE HATCH SAFETY LOCK PIP PIN

LEAD ANALYST: H. Saxon

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/09/87
ASSESSMENT ID: CRWEQP-6201
NASA FMEA #: PIP PIN (1) B
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6201
ITEM: ORBITER SIDE HATCH SAFETY LOCK PIP PIN
LEAD ANALYST: H. SAXON

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-336
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: CRWEQP-6300
NASA FMEA #: REF #1, 2, 3

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6300
ITEM: MIDDECK STOWAGE LOCKER DOOR
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA GROUND RULE STATES THAT LOCKER TOOLS AND MEDICAL SUPPLIES ARE ALWAYS STORED IN SEPARATE LOCKERS. THIS WOULD VIRTUALLY ELIMINATE THE POSSIBILITY THAT THE CREW COULD NOT ACCESS MEDICAL SUPPLIES. SUGGEST THAT IOA CRITICALITY BE CHANGED TO 3/3 TO MATCH NASA'S.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: CRWEQP-6301
NASA FMEA #: REF #4

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6301
ITEM: MIDDECK STOWAGE LOCKER DOOR

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-338
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: CRWEQP-6302
NASA FMEA #: REF #6

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6302
ITEM: MIDDECK STOWAGE LOCKER DOOR HINGE PIN

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-339
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/05/88
ASSESSMENT ID: CRWEQP-6303
NASA FMEA #: REF #5, 7, 8
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6303
ITEM: MIDDECK STOWAGE LOCKER DOOR
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

[ / ] [ ] [ ] [ ] [ ]

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA DOES NOT FEEL THAT THIS FAILURE COULD ACTUALLY RESULT IN SIGNIFICANT DAMAGE TO THE VEHICLE OR SIGNIFICANT INJURY TO THE CREW. RECOMMEND THAT THE IOA CRITICALITY BE CHANGED TO 3/3 TO MATCH NASA'S.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-6400
NASA FMEA #: TREADMILL 9A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6400
ITEM: TREADMILL EXERCISER ASSEMBLY

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

| ADEQUATE [ ] |
| INADEQUATE [ ] |

REMARKS:

REPORT DATE 02/12/88 C-341
ASSESSMENT DATE: 12/07/87
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6401
ITEM: TREADMILL EXERCISER ASSEMBLY BUNGEE FORCE CORD

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88  C-342
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-6402
NASA FMEA #: TREADMILL 4A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6402
ITEM: TREADMILL EXERCISER ASSEMBLY SHOULDER STRAP

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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 02/12/88 C-343
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-6403
NASA FMEA #: TREADMILL 3A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6403
ITEM: TREADMILL EXERCISER ASSEMBLY WAIST BELT
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-344
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-6404
NASA FMEA #: TREADMILL 5A
SUBSYSTEM: CREW EQUIPMENT
ITEM: TREADMILL EXERCISER ASSEMBLY PHYSIOLOGICAL MONITOR
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

NASA DATA:
BASELINE [ ]
NEW [ X ]

CREW EQUIPMENT 6404
TREADMILL EXERCISER ASSEMBLY
PHYSIOLOGICAL MONITOR
L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSessment DATE: 12/07/87
ASSessment ID: CRWEQP-6405
NASA FMEA #: TREADMILL 6A

NASA DATA:
BASELINE []
NEW [  X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6405
ITEM: TREADMILL EXERCISER ASSEMBLY HANDLE ASSEMBLY

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-6406
NASA FMEA #: TREADMILL 5A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6406
ITEM: TREADMILL EXERCISE ASSEMBLY INFRARED SENSOR
LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-347
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-6407
NASA FMEA #: TREADMILL 7A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6407
ITEM: TREADMILL EXERCISER ASSEMBLY SPEED CONTROL KNOB

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-348
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/07/87
ASSESSMENT ID: CRWEQP-6408
NASA FMEA #: TREADMILL 1A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6408
ITEM: TREADMILL EXERCISER ASSEMBLY ATTACHMENT FITTINGS

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
BELIEVE LATER REVISION OF THIS FMEA WILL LOWER THE CRITICALITY OF THE TREADMILL ATTACH POINTS TO A NON-CIL LEVEL TO COMPLY WITH CCB DIRECTIVES.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6500
NASA FMEA #: 07-1-725101-4

NASA DATA:
BASELINE [  ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6500
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) INTENSITY
CONTROL/POWER SWITCH

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:

REPORT DATE 02/12/88 C-350
APPENDIX C

ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6501
NASA FMEA #: 07-1-725101-5

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6501
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) INTENSITY
CONTROL

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:

REPORT DATE 02/12/88 C-351
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6502
NASA FMEA #: 07-1-725101-3

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6502
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) LIGHT BULB

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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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 02/12/88 C-352
## APPENDIX C
### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 1/11/88
**ASSESSMENT ID:** CRWQP-6503
**NASA FMEA #:** 07-1-725101-3

**SUBSYSTEM:** CREW EQUIPMENT
**MDAC ID:** 6503
**ITEM:** CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) MOUNTING BASE

**LEAD ANALYST:** L. GRAHAM, S. SINCLAIR

**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:**

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**REPORT DATE** 02/12/88  C-353
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6504
NASA FMEA #: 07-1-725102-1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6504
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) FORWARD
ADAPTER BRACKET

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

ASSESSMENT:

CRITICALITY
FLIGHT
HDW/FUNC

REDUNDANCY SCREENS

CIL ITEM

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

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

RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-354
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6505
NASA FMEA #: 07-1-725102-2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6505
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) FORWARD ADAPTER BRACKET

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

REPORT DATE 02/12/88 C-355
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6506
NASA FMEA #: 07-1-725103-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6506
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT MOUNTING BRACKET

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-356
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6507
NASA FMEA #: 07-1-725102-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6507
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) FORWARD MOUNTING BRACKET

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88
C-357
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEPQ-6508
NASA FMEA #: 07-1-725101-7

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6508
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) APERTURE STOP

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)
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REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6509
NASA FMEA #: 07-1-725101-6

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6509
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) APERTURE STOP

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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

REMARKS:

REPORT DATE 02/12/88 C-359
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6510
NASA FMEA #: 07-1-725101-3

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6510
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) COMBINER
LENS ASSEMBLY

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-360
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-6511
NASA FMEA #: 07-1-725101-1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 6511
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) BARREL LOCK

LEAD ANALYST: L. GRAHAM, S. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-361
APPENDIX C

ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-11215X
NASA FMEA #: JSC22453-1A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11215
ITEM: EMU LIGHT ASSEMBLY - BATTERY CELL

LEAD ANALYST: H. SAXON

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-11216X
NASA FMEA #: JSC22453-2A

NASA DATA:
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11216
ITEM: EMU LIGHT ASSEMBLY - BATTERY CELL

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-11217X
NASA FMEA #: JSC22453-4A

NASA DATA:
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11217
ITEM: EMU LIGHT ASSEMBLY - THERMOSTAT

LEAD ANALYST: H. SAXON

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* CIL RETENTION RATIONALE: (If applicable)
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REMARKS:

REPORT DATE 02/12/88  C-364
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-11218X
NASA FMEA #: JSC22453-5A

NASA DATA:
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11218
ITEM: EMU LIGHT ASSEMBLY - THERMOSTAT

LEAD ANALYST: H. SAXON

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-365
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87  
ASSESSMENT ID: CRWEQP-11219X  
NASA FMEA #: JSC22453-6A  

ASSESSMENT ID: CRWEQP-11219X  
NASA FMEA #: JSC22453-6A  

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 11219  
ITEM: EMU LIGHT ASSEMBLY - LIGHT SWITCH  
LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88  C-366
APPENDIX C
ASSESSMENT WORKSHEET

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ASSESSMENT ID: CRWEQP-11220X
NASA FMEA #: JSC22453-6B

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11220
ITEM: EMU LIGHT ASSEMBLY - LIGHT SWITCH

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
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REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-11221X
NASA FMEA #: JSC22453-11A

NASA DATA:
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11221
ITEM: EMU LIGHT ASSEMBLY - FINGER CONTACT ASSEMBLY

LEAD ANALYST: H. SAXON

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

REMARKS:

REPORT DATE 02/12/88 C-368
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-11222X
NASA FMEA #: JSC22453-12A

NASA DATA:
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11222
ITEM: EMU LIGHT ASSEMBLY - ELECTRICAL CONNECTOR

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-369
ASSESSMENT DATE: 12/14/87
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NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11325
ITEM: OBS - SIGNAL CONDITIONER - BATTERY CONTACT ASSEMBLY
LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS IS A NEW ITEM ADDED TO THE IOA DATA BASE DURING THE ASSESSMENT PROCESS. IOA CRITICALITY IS MATCHED TO THE NASA IVA CRITICALITY UNDER WORST CASE ANALYSIS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-11326X
NASA FMEA #: OBS 2D
NASA DATA:
BASELINE [ ]
NEW [ X ]
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11326
ITEM: OBS - SIGNAL CONDITIONER
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO THE IOA DATA BASE DURING THE ASSESSMENT
PROCESS. IOA CRITICALITY IS MATCHED TO THE NASA IVA CRITICALITY
UNDER WORST CASE ANALYSIS PROCESS.
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/14/87
ASSESSMENT ID: CRWEQP-11327X
NASA FMEA #: OBS 3B
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11327
ITEM: OBS - IVA CABLE

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)
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* CIL RETENTION RATIONALE: (If applicable)
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REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/17/87
ASSESSMENT ID: CRWEQP-11433X
NASA FMEA #: JSC22480-17B
NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11433
ITEM: PORTABLE FOOT RESTRAINT ARTICULATING SOCKET ASSEMBLY QUICK RELEASE PIN
LEAD ANALYST: H. SAXON

ASSESSMENT:

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

REMARKS:

REPORT DATE 02/12/88 C-373
### APPENDIX C
#### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 11/19/87  
**ASSESSMENT ID:** CRWEQP-12110X  
**NASA FMEA #:** 07-1B-SW7-1  
**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 12110  
**ITEM:** EVA SLIDEWIRE CUSHION  
**LEAD ANALYST:** S.K. SINCLAIR

**ASSESSMENT:**

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

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]  
INADEQUATE [ ]

**REMARKS:**

NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/18/87
ASSESSMENT ID: CRWEQP-12214X
NASA FMEA #: JSC17067B-1C
NASA DATA:  
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 12214
ITEM: ERCM SAFETY TETHER - CABLE THIMBLE

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-13113X
NASA FMEA #: TUBE CUTTER 6H

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13113
ITEM: TUBE CUTTER PAWL

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88  C-376
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-13309X
NASA FMEA #: 3-POINT LATCH 5G
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13309
ITEM: SAFETY RELEASE
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-13310X
NASA FMEA #: 3-POINT LATCH TOOL
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13310
ITEM: RELEASE SPRING
LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88 C-378
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-13418X
NASA FMEA #: EVA WINCH 3N

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13418
ITEM: EVA WINCH AND MOUNT ASSEMBLY PIP PIN

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88 C-379
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-13419X
NASA FMEA #:
EVA WINCH 3M

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13419
ITEM: EVA WINCH AND MOUNT ASSEMBLY PIP PIN

LEAD ANALYST: S.K. SINCLAIR

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:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88 C-380
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-13420X
NASA FMEA #: EVA WINCH 3K

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13420
ITEM: EVA WINCH AND MOUNT ASSEMBLY HOOK

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88   C-381
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-13421X
NASA FMEA #: EVA WINCH 3L
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13421
ITEM: EVA WINCH AND MOUNT ASSEMBLY HOOK
LEAD ANALYST: S.K. SINCLAIR

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:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88 C-382
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEQP-13422X
NASA FMEA #: EVA WINCH 3J
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13422
ITEM: EVA WINCH AND MOUNT ASSEMBLY INTERIOR COIL SPRING

LEAD ANALYST: S.K. SINCLAIR

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

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88   C-383
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-13620X
NASA FMEA #: PRD-6
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13620
ITEM: PAYLOAD RETENTION DEVICE HOUSING ASSEMBLY
LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/15/87
ASSESSMENT ID: CRWEQP-13621X
NASA FMEA #: PRD-3B
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13621
ITEM: PAYLOAD RETENTION DEVICE HOOK LATCH

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

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

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

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88 C-385
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/22/87
ASSESSMENT ID: CRWEOQ-13808X
NASA FMEA #: SNATCH BLOCK - 2B

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13808
ITEM: SNATCH BLOCK ASSEMBLY HOOK LATCH

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88  C-386
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/19/87
ASSESSMENT ID: CRWEQP-13809X
NASA FMEA #: SNATCH BLOCK 2B

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13809
ITEM: SNATCH BLOCK ASSEMBLY HOOK LATCH

LEAD ANALYST: S.K. SINCLAIR

NASA DATA:
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NEW [ X ]

ASSESSMENT:

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

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

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS. 3/3 CRITICALITY IS MORE REALISTIC AND ISSUE WILL BE DISCUSSED WITH NASA SUBSYSTEM MANAGER.

REPORT DATE 02/12/88 C-387
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15182X
NASA FMEA #: 1.1.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15182
ITEM: MANUAL SHUT OFF VALVE (MV3)

LEAD ANALYST: B. RICHARD

ASSESSMENT:

| CRITICALLY REDUNDANCY 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 02/12/88 C-388
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15183X
NASA FMEA #: 1.1.3
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15183
ITEM: MANUAL SHUT OFF VALVE (MV3)

LEAD ANALYST: B. RICHARD

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 02/12/88 C-389
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15184X
NASA FMEA #: 1.3.1

NASA DATA:
NASA DATA: BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15184
ITEM: HOT WATER TANK O-RING

LEAD ANALYST: B. RICHARD

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 02/12/88 C-390
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15185X
NASA FMEA #: 1.4.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15185
ITEM: RECIRCULATION PUMP (P1) SEAL

LEAD ANALYST: B. RICHARD

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| IOA [ 3 /2R ] | [ P ] [ P ] [ P ] [ ] |
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RECOMMENDATIONS: (If different from NASA)
[ / ] [ ] [ ] [ ] [ ] [ ] (ADD/DELETE)

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

REMARKS:

REPORT DATE 02/12/88 C-391
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15186X
NASA FMEA #: 1.5.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15186
ITEM: REHYDRATION PUMP (P2)

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

NASA [ 3 /2R ] [ ] [ ] [ ] [ ] [ ]

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:

REPORT DATE 02/12/88   C-392
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15187X
NASA FMEA #: 1.6.3

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15187
ITEM: COLD WATER RECIRCULATION VALVE (SV1)

LEAD ANALYST: B. RICHARD

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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 02/12/88 C-393
**APPENDIX C**

**ASSESSMENT WORKSHEET**

**ASSESSMENT DATE:** 12/10/87  
**NASA DATA:**  
**ASSESSMENT ID:** CRWEQP-15188X  
**MDAC ID:** 15188  
**ITEM:** RHS COLD WATER RECIRCULATION VALVE (SV2)  
**LEAD ANALYST:** B. RICHARD

### ASSESSMENT:

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

**REMARKS:**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15189X
NASA FMEA #: 1.8.3
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15189
ITEM: RHS OUTLET SOLENOID VALVE (SV3)

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-395
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87  
ASSESSMENT ID: CRWEQP-15190X  
NASA ID: CRWEQP-15190X  
NASA FMEA #: 1.9.3  
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 15190  
ITEM: RHS CHILLED WATER FEED SOLENOID VALVE (SV4)  
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-396
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15191X
NASA FMEA #: 1.10.1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15191
ITEM: CHECK VALVE
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88  C-397
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15192X
NASA FMEA #: 1.10.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15192
ITEM: CHECK VALVE

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15193X
NASA FMEA #: 1.10.3
NASA DATA:

NASA FMEA:

ASSESSMENT ID: CRWEQP-15193X
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15193
ITEM: CHECK VALVE SEAL

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-399
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWQP-15194X
NASA FMEA #: 1.11.1

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15194
ITEM: MIXING VALVE (MV2)

LEAD ANALYST: B. RICHARD

ASSESSMENT:

CRITICALITY
FLIGHT
HDW/FUNC

REDUNDANCY SCREENS
A  B  C

NASA [ ] [ ] [ ] [ ] [ ] [ ]
IOA [ ] [ ] [ ] [ ] [ ] [ ]

COMPARE [ ] [ ] [ ] [ ] [ ] [ ]

RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-400
ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15195X
NASA FMEA #: 1.12.1
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15195
ITEM: MICROBIAL CHECK VALVE
LEAD ANALYST: B. RICHARD

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

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

RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15196X
NASA FMEA #: 1.12.2
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15196
ITEM: MICROBIAL CHECK VALVE SEAL
LEAD ANALYST: B. RICHARD

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

REMARKS:

REPORT DATE 02/12/88 C-402
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15197X
NASA FMEA #: 1.13.1
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15197
ITEM: LINES AND FITTINGS (SEALS)

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15198X
NASA FMEA #: 1.13.2
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15198
ITEM: LINES AND FITTINGS (SEALS)
LEAD ANALYST: B. RICHARD

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A RESTRICTED FLOW COULD RESULT IN LOSS OF THE GALLEY. A DIFFERENCE IN GROUNDRULES ACCOUNTS FOR THE SLIGHT DIFFERENCE IN THE CRITICITY RATINGS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15199X
NASA FMEA #: 1.14.2
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15199
ITEM: RHS NEEDLE SEAL

LEAD ANALYST: B. RICHARD

ASSESSMENT:

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-405
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15200X
NASA FMEA #: 1.15.2
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15200
ITEM: TEMP GAGE SEAL
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-406
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15203X
NASA FMEA #: 1.16.1

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15203
ITEM: RTD SEAL

LEAD ANALYST: B. RICHARD

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:

REPORT DATE 02/12/88 C-407
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15204X
NASA FMEA #: 2.1.3
NASA DATA:
BASELINE [ ]
NEW [ X ]
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15204
ITEM: WATER HEATER SW (S2)

LEAD ANALYST: B. RICHARD

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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 02/12/88 C-408
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15205X
NASA FMEA #: 2.2.3
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15205
ITEM: OVEN HEATER SWITCH (S1)

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-409
APPENDIX C
ASSESSMENT WORKSHEET

ASSessment DATE: 12/10/87
ASSessment ID: CRWQP-15206X
NASA FMEA #: 2.3.3
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15206
ITEM: OVEN BLOWER SWITCH (S3)

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-410
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15207X
NASA FMEA #: 2.9.2
ASSESSMENT ID: CRWEQP-15207X
NASA FMEA #: 2.9.2
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15207
ITEM: WATER HEATER STRIP HEATER (HR1-HR6)
LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-411
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15208X
NASA FMEA #: 2.10.3

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15208
ITEM: WATER HEATER STRIP HEATER THERMOSTAT S1-S12

LEAD ANALYST: B. RICHARD

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

REMARKS:

REPORT DATE 02/12/88 C-412
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15209X
NASA FMEA #: 2.11.2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15209
ITEM: OVEN STRIP HEATERS (HR1-HR4)

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15210X
NASA FMEA #: 2.12.3

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15210
ITEM: OVEN HEATER THERMOSTATS (S1-S8)

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-414
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87

ASSESSMENT ID: CRWEQP-15211X

NASA FMEA #: 2.13.3

SUBSYSTEM: CREW EQUIPMENT

MDAC ID: 15211

ITEM: HOT WATER THERMOSTAT (S13)

LEAD ANALYST: B. RICHARD

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

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REMARKS:

REPORT DATE 02/12/88  C-415
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-15212X
NASA FMEA #: 2.14.1

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15212
ITEM: WIRE HARNESS

LEAD ANALYST: B. RICHARD

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

REMARKS:

REPORT DATE 02/12/88 C-416
### APPENDIX C

#### ASSESSMENT WORKSHEET

**ASSESSMENT DATE:** 12/02/87  
**ASSESSMENT ID:** CRWEQP-15325X  
**NASA FMEA #:** OWDA-2A  
**SUBSYSTEM:** CREW EQUIPMENT  
**MDAC ID:** 15325  
**ITEM:** OWDA SLIDE ASSEMBLY  
**LEAD ANALYST:** S.K. SINCLAIR

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

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**REMARKS:**

NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

**REPORT DATE** 02/12/88  
**C-417**
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-15326X
NASA FMEA #: OWDA-2B
NASA DATA:
BASELINE [ ]
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SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15326
ITEM: OWDA SLIDE ASSEMBLY

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88 C-418
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-15327X
NASA FMEA #: OWDA-2D
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15327
ITEM: REHYDRATION NEEDLE

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88 C-419
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-15328X
NASA FMEA #: OWDA-2E

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15328
ITEM: O-RING

LEAD ANALYST: S.K. SINCLAIR

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

(ADD/DELETE)

ADEQUATE [ ]
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REMARKS:
NEW ITEM ADDED DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88 C-420
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-15329X
NASA FMEA #: OWDA-3C
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15329
ITEM: SOLENOID VALVE - OWDA

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
DISAGREE, HOWEVER, WITH NASA ASSIGNED CRITICALITIES AND ISSUE
WILL BE DISCUSSED WITH SUBSYSTEM MANAGER.

REPORT DATE 02/12/88 C-421
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-15330X
NASA FMEA #: OWDA-4A
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15330
ITEM: OPERATIONAL WATER DISPENSER PRESSURE REGULATOR

LEAD ANALYST: S.K. SINCLAIR

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* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
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REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/02/87
ASSESSMENT ID: CRWEQP-15331X
NASA FMEA #: OWDA-5C
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15331
ITEM: BYPASS VALVE

LEAD ANALYST: S.K. SINCLAIR

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

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
RECOMMEND USING IOA CRITICALITY SINCE NASA FMEA DOES NOT CONSIDER
THE WORST CASE OF A LEAK CAUSING THE OWDA TO BECOME INOPERABLE.

REPORT DATE 02/12/88 C-423
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-15332X
NASA FMEA #: OWDA-6C
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15332
ITEM: OWDA WATER SELECTION VALVE
LEAD ANALYST: S.K. SINCLAIR

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:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS. NASA FMEA DOES NOT TAKE LEAK TO WORST CASE CONDITION OF INADEQUATE WATER FLOW REACHING THE REHYDRATION NEEDLE. LACK OF WATER FOR REHYDRATION WILL RENDER OWDA INOPERABLE AND IF ALL REDUNDANCY IS LOST, WILL RESULT IN MISSION TERMINATION.

REPORT DATE 02/12/88 C-424
**APPENDIX C**

**ASSESSMENT WORKSHEET**

- **ASSESSMENT DATE:** 12/03/87
- **ASSESSMENT ID:** CRWEQP-15333X
- **NASA FMEA #:** OWDA-10B

**NASA DATA:**

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**LEAD ANALYST:** S.K. SINCLAIR

**ASSESSMENT:**

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

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

**REMARKS:**

NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-15334X
NASA FMEA #: OWDA-11B
NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15334
ITEM: OWDA - ROTARY SWITCH

LEAD ANALYST: S.K. SINCLAIR

ASSessment:

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88  C-426
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-15335X
NASA FMEA #: OWDA-12A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15335
ITEM: OWDA - ON/OFF SWITCH

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

CRITICALITY
FLIGHT
HDW/FUNC

REDUNDANCY SCREENS
A  B  C

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

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

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

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

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

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88  C-427
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-15336X
NASA FMEA #: OWDA-6B

DATE: 12/03/87
ASSESSMENT ID: CRWEQP-15336X
NASA FMEA #: OWDA-6B

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15336
ITEM: OWDA - ON/OFF SWITCH

LEAD ANALYST: S.K. SINCLAIR

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

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

(ADD/DELETE)

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

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-15337X
NASA FMEA #: OWDA-13A

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15337
ITEM: OWDA - FILL SWITCH

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

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

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

RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/03/87
ASSESSMENT ID: CRWEQP-15338X
NASA FMEA #: OWDA-13B

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15338
ITEM: OWDA - FILL SWITCH

LEAD ANALYST: S.K. SINCLAIR

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RECOMMENDATIONS: (If different from NASA)

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(ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]

INADEQUATE [ ]

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/04/87
ASSESSMENT ID: CRWEQP-15403X
NASA FMEA #: CWDA-17A

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15403
ITEM: CWDA - CONNECTION TO ORBITER

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

RECOMMENDATIONS: (If different from NASA)

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

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

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.

REPORT DATE 02/12/88 C-431
APPENDIX C  
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87  
ASSESSMENT ID: CRWEQP-16409X  
NASA FMEA #: TREADMILL 1B

NASA DATA:  
BASELINE [ ]  
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 16409  
ITEM: TREADMILL QUICK DISCONNECT

LEAD ANALYST: S.K. SINCLAIR

ASSESSMENT:

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

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

RECOMMENDATIONS: (If different from NASA)

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

*CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]  
INADEQUATE [ ]

REMARKS:

NASA FMEA CURRENTLY REFLECTS A CIL RANKING FOR THE TREADMILL DISCONNECTS. IOA BELIEVES IT WILL BE CHANGED TO A NON-CIL LISTING TO COMPLY WITH A CCB DIRECTIVE.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 12/10/87
ASSESSMENT ID: CRWEQP-16410X
NASA FMEA #: TREADMILL 8A
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16410
ITEM: TREADMILL MONITOR BATTERIES
LEAD ANALYST: S.K. SINCLAIR

NASA DATA:
BASELINE [ ]
NEW [ X ]

NASA FMEA #:
TREADMILL 8A
ASSESSMENT ID:
CRWEQP-16410X
ASSESSMENT DATE:
12/10/87
LEAD ANALYST:
S.K. SINCLAIR
SUBSYSTEM:
CREW EQUIPMENT
MDAC ID:
16410
ITEM:
TREADMILL MONITOR BATTERIES

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

REMARKS:
NEW ITEM ADDED TO IOA DATA BASE DURING ASSESSMENT PROCESS.
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88
ASSESSMENT ID: CRWEQP-16512X
NASA FMEA #: 07-1-725101-2

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16512
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) ADJUSTMENT MECHANISM

LEAD ANALYST: H. SAXON

ASSESSMENT:

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

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

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

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

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

REMARKS:

REPORT DATE 02/12/88   C-434
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/11/88  
ASSESSMENT ID: CRWEQP-16513X  
NASA FMEA #: 07-1-725101-3  

SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 16513  
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT MOUNT ASSEMBLY  
LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
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REMARKS:

REPORT DATE 02/12/88 C-435
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/12/88
ASSESSMENT ID: CRWEQP-16514X
NASA FMEA #: 07-1-725103-4

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16514
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT MOUNT
ASSEMBLY

LEAD ANALYST: H. SAXON

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

REMARKS:
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/12/88
ASSESSMENT ID: CRWEQP-16515X
NASA FMEA #: 07-1-725103-5

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16515
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT MOUNT ASSEMBLY

LEAD ANALYST: H. SAXON

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

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

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

REMARKS:

REPORT DATE 02/12/88 C-437
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/12/88
ASSESSMENT ID: CRWEQP-16516X
NASA FMEA #: 07-1-725103-6

NASA DATA:
BASELINE [ ]
NEW [ X ]

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16516
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT BRACKET ASSEMBLY

LEAD ANALYST: H. SAXON

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RECOMMENDATIONS: (If different from NASA)

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* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:

REPORT DATE 02/12/88 C-438
APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/12/88
ASSESSMENT ID: CRWEQP-16517X
NASA FMEA #: 07-1-725103-7

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16517
ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT BRACKET ASSEMBLY

LEAD ANALYST: H. SAXON

ASSESSMENT:

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

REMARKS:

REPORT DATE 02/12/88 C-439
APPENDIX D

POTENTIAL CRITICAL ITEMS
# APPENDIX D

## POTENTIAL CRITICAL ITEMS

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APPENDIX E
DETAILED ANALYSIS

This appendix contains the IOA analysis worksheets supplementing previous results reported in STSEOS Working Paper 1.0-WP-VA87001-01, Analysis of the Crew Equipment Subsystem, (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. 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
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11215

ITEM: EMU LIGHT ASSEMBLY - BATTERY CELL
FAILURE MODE: TOXIC VENTING

LEAD ANALYST: H. SAXON
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EMU LIGHT ASSEMBLY
3) BATTERY CELL
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: 10161-20072-01

CAUSES: VIBRATION, ELECTRICAL SHORT

EFFECTS/RATIONALE:
AN ELECTRICAL SHORT MAY CAUSE THE ELECTROLYTE TO VENT TOXIC GASES. THE BATTERIES ARE INSPECTED AFTER EVERY FLIGHT. ONCE A BATTERY HAS BEEN USED, IT IS REPLACED WITH A NEW ONE.

REFERENCES:

REPORT DATE 02/12/88 E-2
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87  HIGHEST CRITICALITY  HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 1/1
MDAC ID: 11216  ABORT: /NA

ITEM: EMU LIGHT ASSEMBLY - BATTERY CELL
FAILURE MODE: RAPID VENTING/EXPLOSION

LEAD ANALYST: H. SAXON  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EMU LIGHT ASSEMBLY
3) BATTERY CELL
4)
5)
6)
7)
8)
9)

CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: 10161-20072-01

CAUSES: INTERNAL SHORT

EFFECTS/RATIONALE:
AN INTERNAL SHORT MAY CAUSE RAPID VENTING OF TOXIC GASES OR EXPLOSION. PAST EXPERIENCE AND ACCEPTANCE TESTING SHOW NO FAILURES HAVE OCCURRED.

REFERENCES:

REPORT DATE 02/12/88  E-3
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11217

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

ITEM: EMU LIGHT ASSEMBLY - THERMOSTAT
FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: H. SAXON
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EMU LIGHT ASSEMBLY
3) THERMOSTAT

CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: 10161-20064-01

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, VIBRATION

EFFECTS/RATIONALE:
FAILURE OF THE THERMOSTAT COULD ALLOW THE BATTERIES TO BECOME TOO HOT. THE BATTERIES COULD VENT TOXIC GAS OR EXPLODE.

REFERENCES:
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11218

ITEM: EMU LIGHT ASSEMBLY - THERMOSTAT
FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: H. SAXON
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EMU LIGHT ASSEMBLY
3) THERMOSTAT
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LOCATION: PAYLOAD BAY
PART NUMBER: 10161-20064-01

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, VIBRATION

EFFECTS/RATIONALE:
FAILURE OF THE THERMOSTAT COULD ALLOW THE BATTERIES TO BECOME TOO HOT. THE BATTERIES COULD VENT TOXIC GAS OR EXPLODE.

REFERENCES:

REPORT DATE 02/12/88
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87

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

ITEM: EMU LIGHT ASSEMBLY - LIGHT SWITCH
FAILURE MODE: STICKS ON IN TWO BULB MODE

LEAD ANALYST: H. SAXON
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EMU LIGHT ASSEMBLY
3) LIGHT SWITCH
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LOCATION: PAYLOAD BAY
PART NUMBER: 10161-20064-01

CAUSES:

EFFECTS/RATIONALE:
THE BATTERIES WOULD BE DISCHARGED FASTER THAN PLANNED.

REFERENCES:

REPORT DATE 02/12/88 E-6
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11220

ITEM: EMU LIGHT ASSEMBLY - LIGHT SWITCH
FAILURE MODE: STICKS IN OFF POSITION

LEAD ANALYST: H. SAXON
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EMU LIGHT ASSEMBLY
3) LIGHT SWITCH
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LOCATION: PAYLOAD BAY
PART NUMBER: 10161-20064-01

CAUSES:

EFFECTS/RATIONALE:
LOSS OF A LIGHT COULD MAKE PERFORMANCE OF TASKS MORE DIFFICULT. OTHER LIGHTS ARE AVAILABLE.

REFERENCES:

REPORT DATE 02/12/88 E-7
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11221

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

ITEM: EMU LIGHT ASSEMBLY - FINGER CONTACT ASSEMBLY
FAILURE MODE: LOSS OF BATTERY POWER TO CIRCUIT

LEAD ANALYST: H. SAXON
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EMU LIGHT ASSEMBLY
3) FINGER CONTACT ASSEMBLY

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LOCATION: PAYLOAD BAY
PART NUMBER: 10161-20041-02

CAUSES:

EFFECTS/RATIONALE:
LOSS OF POWER TO THE SEQUENCING CIRCUIT MEANS LOSS OF LIGHT
ASSEMBLY FUNCTION. EXTRA LIGHT ASSEMBLY IS AVAILABLE.

REFERENCES:

REPORT DATE 02/12/88 E-8
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/11/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11222

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

ITEM: EMU LIGHT ASSEMBLY - ELECTRICAL CONNECTOR
FAILURE MODE: LOSS OF POWER TO SEQUENCING CIRCUIT

LEAD ANALYST: H. SAXON
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EMU LIGHT ASSEMBLY
3) ELECTRICAL CONNECTOR

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LOCATION: PAYLOAD BAY
PART NUMBER: ST20C1080-02

CAUSES:

EFFECTS/RATIONALE:
LOSS OF POWER TO THE SEQUENCING CIRCUIT MEANS LOSS OF LIGHT ASSEMBLY FUNCTION. EXTRA LIGHT ASSEMBLY IS AVAILABLE.

REFERENCES:

REPORT DATE 02/12/88 E-9
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/14/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11325

ITEM: OBS - SIGNAL CONDITIONER - BATTERY CONTACT ASSEMBLY
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL BIOINSTRUMENTATION SYSTEM
3) SIGNAL CONDITIONER
4) BATTERY CONTACT ASSEMBLY
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LOCATION: CREW MODULE
PART NUMBER: TBD

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

EFFECTS/RATIONALE:
LOSS OF THE BATTERY CONTACT ASSEMBLY WILL MEAN LOSS OF SIGNAL CONDITIONER POWER AND LOSS OF THE SIGNAL CONDITIONER. THE SIGNAL CONDITIONER FROM THE SECOND OBS CAN BE USED AS A REPLACEMENT ITEM BUT LOSS OF ALL REDUNDANCY DURING USE ON AN IVA CREWMEMBER CAN RESULT IN A LOSS OF MISSION.

REFERENCES: JSC-12770

REPORT DATE 02/12/88 E-10
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/14/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11326

ITEM: OBS - SIGNAL CONDITIONER
FAILURE MODE: OPEN (ELECTRICAL), SHORTED

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL BIOINSTRUMENTATION SYSTEM
3) SIGNAL CONDITIONER

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LOCATION: CREW MODULE
PART NUMBER: TBD

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

EFFECTS/RATIONALE:
AN OPEN OR SHORT CIRCUIT WITHIN THE OBS SIGNAL CONDITIONER WILL MEAN THE LOSS OF THE SIGNAL CONDITIONER. LOSS OF ALL REDUNDANCY WHEN THE ITEM IS REQUIRED FOR USE BY AN IVA CREWMEMBER CAN RESULT IN A LOSS OF MISSION.

REFERENCES: JSC-12770

REPORT DATE 02/12/88 E-11
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/14/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 11327

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

ITEM: OBS - IVA CABLE
FAILURE MODE: OPEN (ELECTRICAL), SHORTED

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL BIOINSTRUMENTATION SYSTEM
3) IVA CABLE
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LOCATION: CREW MODULE
PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, CONTAMINATION

EFFECTS/RATIONALE:
AN OPEN OR SHORTED CIRCUIT WITHIN THE IVA CABLE WILL RESULT IN A LOSS OF THE OBS. IF THE OBS IS REQUIRED FOR USE ON AN IVA CREWMEMBER, THE LOSS COULD RESULT IN A LOSS OF MISSION.

REFERENCES: JSC-12770

REPORT DATE 02/12/88 E-12
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/17/87             HIGHEST CRITICALITY HDW/func
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 3/2R
MDAC ID: 11433             ABORT: /NA

ITEM: PORTABLE FOOT RESTRRAINT ARTICULATING SOCKET
ASSEMBLY QUICK RELEASE PIN
FAILURE MODE: CANNOT REMOVE PIN

LEAD ANALYST: H. SAXON        SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) PORTABLE FOOT RESTRAINT
3) ARTICULATING SOCKET ASSEMBLY
4) QUICK RELEASE PIN
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LOCATION: PAYLOAD BAY
PART NUMBER: 10159-10035

CAUSES: CONTAMINATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:
QUICK RELEASE PIN CANNOT BE REMOVED. PLATFORM ASSEMBLY CANNOT BE DETACHED FROM ARTICULATING ASSEMBLY.

REFERENCES: JSC-20466, 10155-10035

REPORT DATE 02/12/88  E-13
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/19/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 12110

ITEM: EVA SLIDEWIRE CUSHION
FAILURE MODE: STRUCTURAL FAILURE

LEAD ANALYST: S.K. SINCLAIR  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EVA SLIDEWIRE ASSEMBLY
3) DEPLOYMENT MECHANISM
4) CUSHION
5) 
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REDUNDANCY SCREENS: A [ ]  B [ ]  C [ ]

LOCATION: PAYLOAD BAY
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

REFERENCES: JSC-12770

REPORT DATE 02/12/88  E-14
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/18/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 12214

HIGHEST CRITICALITY
HDW/FUNC

FLIGHT: 3/3
ABORT: /NA

ITEM: ERCM SAFETY TETHER - CABLE THIMBLE
FAILURE MODE: STRUCTURAL FAILURE

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) ERCM SAFETY TETHER
3) CABLE THIMBLE
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REDUNDANCY SCREENS: A [ ]  B [ ]  C [ ]

LOCATION: PAYLOAD BAY
PART NUMBER:

CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE

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

REFERENCES: 10162-10062

REPORT DATE 02/12/88   E-15
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87

SUBSYSTEM: CREW EQUIPMENT

MDAC ID: 13113

ITEM: TUBE CUTTER PAWL

FAILRE MODE: PHYSICAL BINDING/JAMMING

HIGHEST CRITICALITY: FLIGHT: 2/1R

ABORT: /NA

LEAD ANALYST: S.K. SINCLAIR

SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) TUBE CUTTER
3) PAWL
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LOCATION: PAYLOAD BAY

PART NUMBER: SED33101368

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
UNABLE TO COMPLETE CUTTING SEQUENCE. FAILURE RESULTS IN LOSS OF TOOL FUNCTION. USED TO CUT DRIVER TUBES ON PAYLOAD BAY DOOR. IF UNABLE TO CLOSE DOORS THE VEHICLE IS UNABLE TO DEORBIT. LOSS OF ALL REDUNDANCY WILL RESULT IN LOSS OF LIFE AND VEHICLE.

REFERENCES: JSC-12770, SFOM VOL 15, JSC-20466, SED33101368

REPORT DATE 02/12/88 E-16
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13309

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

ITEM: SAFETY RELEASE
FAILURE MODE: FAILS TO RELEASE

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) 3-POINT LATCH TOOL
3) SAFETY RELEASE
4) 
5) 
6) 
7) 
8) 
9) 

CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: SED33101327

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
SAFETY RELEASE FAILS TO RELEASE. THE CREWMEMBER IS UNABLE TO
(AUTOMATICALLY) SPRING THE TOOL OPEN TO GRAB THE LATCH. HOWEVER,
THE CREWMEMBER CAN RATCHET THE TOOL UNTIL THE RELEASE MECHANISM
BREAKS AND THE TOOL OPENS.

REFERENCES: JSC-12770, SFOM VOL 15, JSC-20466, SED33101327

REPORT DATE 02/12/88 E-17
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87

HIGHEST CRITICALITY

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13310

FAILURE MODE: STRUCTURAL FAILURE

ITEM: RELEASE SPRING

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) 3-POINT LATCH TOOL
3) RELEASE SPRING
4) 
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CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: SED33101327

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
UNABLE TO SPRING TOOL OPEN TO GRAB LATCH. CREWMEMBER CAN RATCHET TOOL UNTIL CONTACT IS MADE WITH LATCH.

REFERENCES: JSC-12770, SFOM VOL 15, JSC-20466, SED33101327

REPORT DATE 02/12/88 E-18
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13418

ITEM: EVA WINCH AND MOUNT ASSEMBLY PIP PIN
FAILURE MODE: CANNOT BE REMOVED

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EVA WINCH AND MOUNT ASSEMBLY
3) PIP PIN

CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: SED331015170

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
THE PIP PIN IS REMOVED ONLY DURING GROUND OPERATIONS AND HAS NO EFFECT ON ORBITAL OPERATIONS. IT IS BEING ADDED ONLY FOR COMPLETENESS AND AGREEMENT WITH NASA FMEAs.

REFERENCES: JSC-12770, SFOM VOL 15, JSC-20466, SED33101570
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13419

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

ITEM: EVA WINCH AND MOUNT ASSEMBLY PIP PIN
FAILURE MODE: CANNOT BE INSERTED

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EVA WINCH AND MOUNT ASSEMBLY
3) PIP PIN

CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: SED331015170

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:

PIP PIN IS INSERTED ONLY DURING GROUND TURNAROUND OPERATION. THIS FAILURE HAS NO EFFECT ON CREW OR FLIGHT OPERATIONS AND IS INCLUDED ONLY FOR COMPLETENESS IN COMPARISON WITH NASA FMEAs.

REFERENCES: JSC-12770, SFOM VOL 15, JSC-20466, SED33101570

REPORT DATE 02/12/88 E-20
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/87

SUBSYSTEM: CREW EQUIPMENT

MDAC ID: 13420

ITEM: EVA WINCH AND MOUNT ASSEMBLY HOOK

FAILURE MODE: HOOK JAMS CLOSED

LEAD ANALYST: S.K. SINCLAIR

SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EVA WINCH AND MOUNT ASSEMBLY
3) HOOK

CRITICALITIES

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

LOCATION: PAYLOAD BAY

PART NUMBER: SED331015170

CAUSES: CONTAMINATION, MATERIAL DEFORMATION

EFFECTS/RATIONALE:
UNABLE TO ATTACH HOOK. LATCH CAN BE BENT OUT OF THE WAY AND HOOK SECURED WITH TAPE.

REFERENCES: JSC-12770, SFOM VOL 15, JSC-20466, SED33101570

REPORT DATE 02/12/88  E-21
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/87  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 3/3
MDAC ID: 13421  ABORT: /NA

ITEM: EVA WINCH AND MOUNT ASSEMBLY HOOK
FAILURE MODE: HOOK JAMS OPEN

LEAD ANALYST: S.K. SINCLAIR  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EVA WINCH AND MOUNT ASSEMBLY
3) HOOK
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CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: SED331015170

CAUSES: MATERIAL FAILURE

EFFECTS/RATIONALE:
UNABLE TO SECURE HOOK BY NORMAL METHODS. HOOK CAN BE SECURED WITH TAPE.

REFERENCES: JSC-12770, SFOM VOL 15, JSC-20466, SED33101570

REPORT DATE 02/12/88  E-22
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/87  FLIGHT: 3/3
SUBSYSTEM: CREW EQUIPMENT  ABORT: NA
MDAC ID: 13422

ITEM: EVA WINCH AND MOUNT ASSEMBLY INTERIOR COIL SPRING
FAILURE MODE: STRUCTURAL FAILURE (BREAKS)

LEAD ANALYST: S.K. SINCLAIR  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) EVA WINCH AND MOUNT ASSEMBLY
3) INTERIOR COIL SPRING

CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: SED331015170

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
UNABLE TO USE AUTOMATIC REEL IN FEATURE. CREW STILL ABLE TO REEL IN MANUALLY.

REFERENCES: JSC-12770, SFOM VOL 15, JSC-20466, SED33101570

REPORT DATE 02/12/88  E-23
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/15/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13620

ITEM: PAYLOAD RETENTION DEVICE HOUSING ASSEMBLY
FAILURE MODE: STRUCTURAL FAILURE/FRACTURES

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) PAYLOAD RETENTION DEVICE
3) HOUSING ASSEMBLY
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CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: 10163-10063-03

CAUSES: OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:
HOUSING ASSEMBLY BREAKS DURING ENTRY. THE RMS OR PAYLOAD COMES LOOSE IN THE PAYLOAD BAY WITH THE POSSIBILITY OF RESULTING DAMAGE TO THE VEHICLE AND POSSIBLE LOSS OF LIFE OF THE CREW.

REFERENCES: JSC-20466, 10163-10063

REPORT DATE 02/12/88  E-24
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/15/87  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 3/1R
MDAC ID: 13621  ABORT: /NA

ITEM: PAYLOAD RETENTION DEVICE HOOK LATCH
FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: S.K. SINCLAIR  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) PAYLOAD RETENTION DEVICE
3) HOOK LATCH
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CRITICALITIES

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LOCATION: PAYLOAD BAY
PART NUMBER: 10163-10063-03

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
HOOK LATCH FAILING TO OPEN WILL MEAN LOSS OF TOOL FUNCTION. TWO DEVICES ARE FLOWN ON EACH FLIGHT PLUS RMS/PAYLOAD JETTISON CAPABILITY STILL EXISTS. LOSS OF ALL REDUNDANCY, HOWEVER, CAN MEAN LOSS OF CREW AND VEHICLE.

REFERENCES: JSC-20466, 10163-10063

REPORT DATE 02/12/88  E-25
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/22/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13808

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

ITEM: SNATCH BLOCK ASSEMBLY HOOK LATCH
FAILURE MODE: FAILS TO CLOSE, JAMS OPEN

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) SNATCH BLOCK ASSEMBLY
3) HOOK LATCH
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CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: SED33102357

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE

EFFECTS/RATIONALE:
THE HOOK LATCH FAILING OPEN WILL HAVE NO EFFECT ON CREW OPERATIONS OR SAFETY. HOOK CAN BE MANUALLY CLOSED OR SECURED WITH TAPE.

REFERENCES: JSC-20466, SED33012357

REPORT DATE 02/12/88 E-26
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/19/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 13809

ITEM: SNATCH BLOCK ASSEMBLY HOOK LATCH
FAILURE MODE: FAILS OPEN

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) SNATCH BLOCK ASSEMBLY
3) HOOK LATCH

CRITICALITIES

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

LOCATION: PAYLOAD BAY
PART NUMBER: SED33102357

CAUSES: CONTAMINATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:
HOOK LATCH JAMS OPEN AND THE CREW IS UNABLE TO SECURE THE TOOL. TAPE OR OTHER MEANS OF SECURING THE TOOL ARE STILL AVAILABLE OR THE CREW CAN MANUALLY CLOSE THE HOOK.

REFERENCES: JSC-20466, SED33012357

REPORT DATE 02/12/88
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15182

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

ITEM: MANUAL SHUT OFF VALVE (MV3)
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) MANUAL SHUT OFF VALVE (MV3)
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CRITICALITIES

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

LOCATION: GALLEY
PART NUMBER: MV3

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS VALVE SUPPLIES AMBIENT WATER TO THE HOT WATER LOOP OF THE GALLEY. IF IT FAILS CLOSED, THERE WILL BE NO HOT WATER FOR REHYDRATION.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-28
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15183

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

ITEM: MANUAL SHUT OFF VALVE (MV3)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) MANUAL SHUT OFF VALVE (MV3)
5) SEAL FAILURE
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LOCATION: GALLEY
PART NUMBER: MV3

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
FAILURE OF THE SEAL WILL RESULT IN FREE WATER IN THE CABIN WHICH CAN BE A HAZARD TO OTHER SYSTEMS. THIS FAILURE WOULD HAVE LITTLE EFFECT ON THE OPERATION OF THE GALLEY AND COULD BE CONTROLLED IF DETECTED BY A CREWMAN.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS
INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87  
SUBSYSTEM: CREW EQUIPMENT  
MDAC ID: 15184  

ITEM: HOT WATER TANK O-RING  
FAILURE MODE: EXTERNAL LEAKAGE  

LEAD ANALYST: B. RICHARD  
SUBSYS LEAD: S.K. SINCLAIR  

BREAKDOWN HIERARCHY:  
1) CREW EQUIPMENT  
2) GALLEY  
3) HOT WATER SYSTEM  
4) HOT WATER TANK  
5) O-RING  

CRITICALITIES  

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LOCATION: GALLEY  
PART NUMBER:  
CAUSES: PIECE-PART FAILURE  
EFFECTS/RATIONALE:  
FAILURE OF THE O-RING WOULD RESULT IN A SMALL AMOUNT OF FREE WATER IN THE CABIN WHICH COULD POSE A HAZARD TO OTHER SYSTEMS. IF CREWMEN CANNOT CONTROL THE LEAK, THE HOT WATER WOULD HAVE TO BE SHUT DOWN AND WOULD NOT BE AVAILABLE FOR THE REST OF THE MISSION.  
REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS  

REPORT DATE 02/12/88 E-30
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15185

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

ITEM: RECIRCULATION PUMP (P1) SEAL
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) HOT WATER SYSTEM
4) RECIRCULATION PUMP (P1)
5) SEAL
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LOCATION: GALLEY
PART NUMBER: P1

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
FAILURE OF THE SEAL COULD RESULT IN FREE WATER IN THE CABIN WHICH COULD POSE A HAZARD TO OTHER SYSTEMS. IF THE LEAK CANNOT BE CONTROLLED, THE HOT WATER WILL HAVE TO BE SHUT DOWN AND WOULD NOT BE AVAILABLE FOR THE REST OF THE MISSION.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-31
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15186

ITEM: REHYDRATION PUMP (P2)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) REHYDRATION STATION PUMP
4) SEAL
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LOCATION: GALLEY
PART NUMBER: P2

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
FAILURE OF THE SEAL WILL RESULT IN FREE WATER IN THE CABIN WHICH COULD POSE A HAZARD TO OTHER SYSTEMS. CREWMEN SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-32
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15187

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

ITEM: COLD WATER RECIRCULATION VALVE (SV1)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) RHS WATER SUPPLY
4) SOLENOID VALVE
5) SEAL
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LOCATION: GALLEY
PART NUMBER: SV1

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH CAN POSE A HAZARD TO OTHER SYSTEMS. CREWMEN SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15188

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

ITEM: RHS COLD WATER RECIRCULATION VALVE (SV2)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) BYPASS SOLENOID VALVE
5) SEAL
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LOCATION: GALLEY
PART NUMBER: SV2

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH CAN POSE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-34
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87  HIGHEST CRITICALITY  HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 3/2R
MDAC ID: 15189  ABORT: /

ITEM: RHS OUTLET SOLENOID VALVE (SV3)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) RHS WATER SUPPLY
4) OUTLET SOLENOID VALVE
5) SEAL

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LOCATION: GALLEY
PART NUMBER: SV3

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH CAN POSE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88  E-35
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15190
FLIGHT: 3/2R
ABORT: /

ITEM: RHS CHILLED WATER FEED SOLENOID VALVE (SV4)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) RHS WATER SUPPLY SYSTEM
4) CHILLED WATER FEED SOLENOID VALVE
5) SEAL
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LOCATION: GALLEY
PART NUMBER: SV4

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH CAN POSE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15191

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

ITEM: CHECK VALVE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) CHECK VALVE
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: GALLEY
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
THE CHECK VALVE ALLOWS A FLOW OF HOT WATER THROUGH MV2 TO THE AUXILIARY PORT. THIS FAILURE WOULD HAVE VERY LITTLE EFFECT ON THE OPERATION OF THE GALLEY AND COULD EVEN GO UNNOTICED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-37
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15192

ITEM: CHECK VALVE
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) CHECK VALVE

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

LOCATION: GALLEY
PART NUMBER:

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WOULD PREVENT HOT WATER FROM BEING AVAILABLE TO THE AUXILIARY PORT BUT WOULD HAVE NO ADVERSE EFFECT ON THE NORMAL OPERATION OF THE GALLEY.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-38
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15193

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

ITEM: CHECK VALVE SEAL
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) CHECK VALVE
5) SEAL
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LOCATION: GALLEY

PART NUMBER:

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WOULD RESULT IN FREE WATER IN THE CABIN WHICH COULD BE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-39
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15194

ITEM: MIXING VALVE (MV2)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) MIXING VALVE (MV2)
5) SEAL
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LOCATION: GALLEY
PART NUMBER: MV2

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH MAY POSE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-40
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15195

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

ITEM: MICROBIAL CHECK VALVE
FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) MICROBIAL CHECK VALVE
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CRITICALITIES

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

LOCATION: GALLEY
PART NUMBER:

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
The worst case restriction will prevent using the auxiliary port. The normal operation of the galley will not be affected by this failure.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-41
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15196

ITEM: MICROBIAL CHECK VALVE SEAL
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) MICROBIAL CHECK VALVE
5) SEAL
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LOCATION: GALLEY
PART NUMBER:

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH MAY POSE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-42
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15197

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

ITEM: LINES AND FITTINGS (SEALS)
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) LINES AND FITTINGS
5) SEALS
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LOCATION: GALLEY
PART NUMBER:

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH MAY POSE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-43
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  HIGHEST CRITICALITY  FLIGHT: 3/3  HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  ABORT: /
MDAC ID: 15198

ITEM: LINES AND FITTINGS (SEALS)  FAILURE MODE: RESTRICTED FLOW

LEAD ANALYST: B. RICHARD  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) LINES AND FITTINGS
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REDUNDANCY SCREENS: A [ ]  B [ ]  C [ ]

LOCATION: GALLEY
PART NUMBER:

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
THE WORST CASE RESTRICTION WOULD PREVENT USE OF THE GALLEY -
OTHER SOURCES OF WATER WOULD HAVE TO BE USED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88  E-44
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15199

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

ITEM: RHS NEEDLE SEAL
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) RHS NEEDLE SEAL
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LOCATION: GALLEY
PART NUMBER:

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
THE FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH MAY POSE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ALBE TO CONTROL THE LEAK.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-45
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15200

ITEM: TEMP GAGE SEAL
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) TEMP GAGE
5) SEAL

CRITICALITIES

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LOCATION: GALLEY
PART NUMBER:

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THE FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH MAY POSE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ABLE TO CONTROL THIS LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15203

ITEM: RTD SEAL
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) WATER SUPPLY
4) RTD
5) SEAL

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LOCATION: GALLEY

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:
THIS FAILURE WILL RESULT IN FREE WATER IN THE CABIN WHICH MAY POSE A HAZARD TO OTHER SYSTEMS. THE CREW SHOULD BE ABLE TO CONTROL THE LEAK IF IT CAN BE DETECTED.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-47
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15204

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

ITEM: WATER HEATER SW (S2)
FAILURE MODE: SHORTED

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) ELECTRICAL
4) WATER HEATER SWITCH
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: GALLEY
PART NUMBER: S2

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
SHORT TO CASE WILL CAUSE CIRCUIT BREAKER TO TRIP.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88   E-48
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15205

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

ITEM: OVEN HEATER SWITCH (S1)
FAILURE MODE: SHORTED

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) ELECTRICAL
4) OVEN HEATER SW (S1)
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: GALLEY
PART NUMBER: S1

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
SHORT TO CASE WILL CAUSE CIRCUIT BREAKER TO TRIP.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-49
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15206

ITEM: OVEN BLOWER SWITCH (S3)
FAILURE MODE: SHORTED

LEAD ANALYST: B. RICHARD  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) ELECTRICAL
4) OVEN BLOWER SWITCH

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

LOCATION: GALLEY
PART NUMBER: S3

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
SHORT TO CASE WILL CAUSE CIRCUIT BREAKER TO TRIP.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-50
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15207

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

ITEM: WATER HEATER STRIP HEATER (HR1-HR6)
FAILURE MODE: SHORTED

LEAD ANALYST: B. RICHARD SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) ELECTRICAL
4) WATER HEATER STRIP HEATER
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: GALLEY
PART NUMBER: HR1-HR6

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
SHORT TO CASE WILL CAUSE CIRCUIT BREAKER TO TRIP.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-51
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15208

ITEM: WATER HEATER STRIP HEATER THERMOSTAT S1-S12
FAILURE MODE: SHORTED

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) ELECTRICAL
4) WATER HEATER STRIP HEATER THERMOSTAT
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REDUNDANCY SCREENS:  A [ ]  B [ ]  C [ ]

LOCATION: GALLEY
PART NUMBER: S1-S12
CAUSES: CONTAMINATION, PIECE-PART FAILURE
EFFECTS/RATIONALE:
SHORT TO CASE WILL TRIP THE CIRCUIT BREAKER.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-52
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15209

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

ITEM: OVEN STRIP HEATERS (HR1-HR4)
FAILURE MODE: SHORTED

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) ELECTRICAL
4) OVEN STRIP HEATERS
5)
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CRITICALITIES

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

LOCATION: GALLEY
PART NUMBER: HR1-HR4

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
SHORT TO CASE WILL CAUSE CIRCUIT BREAKER TO TRIP.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-53
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87

SUBSYSTEM: CREW EQUIPMENT

MDAC ID: 15210

ITEM: OVEN HEATER THERMOSTATS (S1-S8)

FAILURE MODE: SHORTED

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) ELECTRICAL
4) OVEN HEATER THERMOSTATS
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CRITICALITIES

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

LOCATION: GALLEY
PART NUMBER: S1-S8

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
SHORT TO CASE WILL CAUSE CIRCUIT BREAKER TO TRIP.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-54
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 3/3
MDAC ID: 15211  ABORT: /

ITEM: HOT WATER THERMOSTAT (S13)
FAILURE MODE: SHORTED

LEAD ANALYST: B. RICHARD  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) ELECTRICAL
4) HOT WATER THERMOSTAT
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CRITICALITIES

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

LOCATION: GALLEY
PART NUMBER: S13

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:
SHORT TO CASE WILL CAUSE CIRCUIT BREAKER TO TRIP.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88  E-55
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15212

ITEM: WIRE HARNESS
FAILURE MODE: SHORTED

LEAD ANALYST: B. RICHARD
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) GALLEY
3) ELECTRICAL
4) WIRE HARNESS

CRITICALITIES

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

LOCATION: GALLEY
PART NUMBER:

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:
WORST CASE FAILURE COULD RESULT IN LOSS OF GALLEY. ALTERNATE SOURCE OF WATER WOULD HAVE TO BE USED FOR COMPLETION OF MISSION.

REFERENCES: JSC 12770, SSSH 6.6, GALLEY UPGRADE MODIFICATIONS

REPORT DATE 02/12/88 E-56
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15325

ITEM: OWDA SLIDE ASSEMBLY
FAILURE MODE: STUCK IN UP OR DOWN POSITION

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OWDA
3) SLIDE ASSEMBLY
4) ...

CRITICALITIES

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LOCATION: CREW MODULE
PART NUMBER: SED 48101600

CAUSES: CONTAMINATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:
SLIDE ASSEMBLY IS STUCK IN UP OR DOWN POSITION. CREW IS UNABLE TO DISPENSE WATER WITH THE OWDA. IF CWDA SUBSEQUENTLY FAILS, MISSION SHOULD BE TERMINATED.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88 E-57
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15326

ITEM: OWDA SLIDE ASSEMBLY
FAILURE MODE: STRUCTURAL FAILURE

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) SLIDE ASSEMBLY
4) HANDLE
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:
HANDLE BREAKS BUT SLIDE ASSEMBLY STILL ACCESSIBLE AND OWDA IS STILL USABLE.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88 E-58
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15327

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

ITEM: REHYDRATION NEEDLE
FAILURE MODE: NO FLOW

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) NEEDLE
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RTLS: /NA                   TAL: /NA
AOA: /NA                   ATO: /NA


LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: CONTAMINATION, STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CONTAMINATION OR BENDING PREVENTS WATER FLOW THROUGH REHYDRATION NEEDLE. IF SPARE NEEDLE AND CONTINGENCY WATER DISPENSER SUBSEQUENTLY FAIL, THEN MISSION SHOULD BE TERMINATED.

REFERENCES: JSC-12770, SFOM VOL 15, JSC-20365, SED48101600

REPORT DATE 02/12/88 E-59
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15328

ITEM: O-RING
FAILURE MODE: INTERNAL/EXTERNAL LEAKAGE

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) SLIDE ASSEMBLY
4) O-RING
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: CONTAMINATION, DEFECTIVE MATERIAL

EFFECTS/RATIONALE:
LEAKAGE FROM THE O-RING MAY RESULT IN A SMALL AMOUNT OF WATER BEING FREE IN THE CABIN. THE WATER CAN BE CONTAINED BY THE CREW WITH NO RESULTING DAMAGE OR SAFETY IMPLICATIONS.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88  E-60
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15329

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

ITEM: SOLENOID VALVE - OWDA
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) SOLENOID VALVE
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LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: SEAL DAMAGE

EFFECTS/RATIONALE:
DAMAGE TO THE SOLENOID VALVE SEAL MAY ALLOW A SMALL AMOUNT OF
WATER TO LEAK INTO THE CREW MODULE. IF SMALL ENOUGH, THE LEAK
CAN BE CONTAINED BY THE CREW AND THE OWDA WILL REMAIN
OPERATIONAL. HOWEVER, A LARGE LEAK WILL CAUSE THE SOLENOID VALVE
AND OWDA TO BE CONSIDERED BROKEN.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88  E-61
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15330

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

ITEM: OPERATIONAL WATER DISPENSER PRESSURE REGULATOR
FAILURE MODE: REGULATES HIGH

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) PRESSURE REGULATOR
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: CONTAMINATION, SPRING BREAKS, MECHANISM JAMS

EFFECTS/RATIONALE:
WATER PRESSURE AND DELIVERED FLOW RATE ARE INCREASED. CREW CAN USE A LOWER VOLUME SETTING OR THE BYPASS VALVE TO CONTINUE OPERATION OF THE OWDA.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/02/87  HIGHEST CRITICALITY  HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 3/2R
MDAC ID: 15331  ABORT: 3/2R

ITEM: BYPASS VALVE
FAILURE MODE: EXTERNAL LEAKAGE

LEAD ANALYST: S.K. SINCLAIR  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) BYPASS VALVE
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LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: SEAL DAMAGE

EFFECTS/RATIONALE:
DAMAGE TO THE BYPASS VALVE SEAL WILL CAUSE A LEAK INTO THE CREW
MODULE. IF THE LEAK IS SMALL ENOUGH THE WATER CAN BE CONTAINED
BY THE CREW AND THE OWDA WILL REMAIN OPERATIONAL. HOWEVER, IN
THE WORST CASE, THE LEAKAGE WILL CAUSE A REDUCTION IN THE
WATER DELIVERED TO THE CREW AND NON-OPERATION OF THE OWDA. LOSS
OF ALL WATER DELIVERY REDUNDANCY WILL RESULT IN MISSION
TERMINATION.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88  E-63
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 3/2R
MDAC ID: 15332  ABORT: /NA

ITEM: OWDA WATER SELECTION VALVE
FAILURE MODE: INTERNAL/LEAKAGE VALVE

LEAD ANALYST: S.K. SINCLAIR  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) WATER SELECTION VALVE

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LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: SEAL DAMAGE

EFFECTS/RATIONALE:
DAMAGE TO WATER SELECTION VALVE SEAL MAY ALLOW WATER TO LEAK INTO
THE CREW MODULE. IF THE LEAK IS SMALL, THE WATER CAN BE
CONTAINED BY THE CREW AND THE OWDA WILL REMAIN OPERATIONAL.
HOWEVER, A WORST CASE LEAK WILL RESULT IN INSUFFICIENT WATER
REACHING THE REHYDRATION NEEDLE AND AN INOPERABLE OWDA. IN THIS
CASE, LOSS OF ALL REDUNDANCY WILL RESULT IN MISSION TERMINATION.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88  E-64
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15333

HIGHEST CRITICALITY
HDW/FUNC

FLIGHT: 3/2R
ABORT: /NA

ITEM: HOSE ASSEMBLY
FAILURE MODE: INTERNAL/EXTERNAL LEAKAGE

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) HOSE ASSEMBLY
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CRITICALITIES

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LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: MECHANICAL SHOCK, VIBRATION, DEFECTIVE MATERIAL

EFFECTS/RATIONALE:
A LEAK IN THE LINE GOING FROM THE ORBITER WATER SUPPLY TO THE OWDA WILL RESULT IN WATER IN THE CABIN AND AN INOPERABLE OWDA. SUBSEQUENT FAILURES IN THE WATER DELIVERY SYSTEM WILL RESULT IN MISSION TERMINATION.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88 E-65
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87

SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15334

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

ITEM: OWDA - ROTARY SWITCH
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) ROTARY SWITCH

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

LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: CONTAMINATION, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
THE OWDA ROTARY SWITCH FAILS TO A GIVEN POSITION WHICH WILL PERMIT ONLY ONE QUANTITY OF WATER TO BE DELIVERED. THE OWDA IS STILL OPERATIONAL BY USING THE BYPASS VALVE.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88 E-66
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15335

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

ITEM: OWDA - ON/OFF SWITCH
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) ON/OFF SWITCH
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LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: CONTAMINATION, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
LOSS OF OUTPUT FROM THE ON/OFF SWITCH MEANS THE OWDA CANNOT BE OPERATED IN ITS NOMINAL MODE. THE BYPASS VALVE AND THE CONTINGENCY WATER DISPENSER ARE STILL AVAILABLE. HOWEVER, THE MISSION MUST BE TERMINATED FOR LOSS OF ALL WATER DELIVERY REDUNDANCY.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88 E-67
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15336

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

ITEM: OWDA - ON/OFF SWITCH
FAILURE MODE: FAILS ON

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) ON/OFF SWITCH

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

LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: CONTAMINATION, VIBRATION

EFFECTS/RATIONALE:
THE ON/OFF SWITCH FAILS ON WHICH RESULTS IN THE OWDA BEING CONTINUOUS POWERED. THIS CAN CAUSE INADVERTENT ACTIVATION BUT NO SAFETY CONCERNS.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88 E-68
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15337

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

ITEM: OWDA - FILL SWITCH
FAILURE MODE: FAILS OPEN

LEAD ANALYST: S.K. SINCLAIR SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) FILL SWITCH
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LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: CONTAMINATION, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
IF THE OWDA FILL SWITCH FAILS OPEN, THE "AUTOMATIC" FEATURE OF
THE REHYDRATION CYCLE WILL NOT OPERATE. THE BYPASS VALVE AND THE
CONTINGENCY WATER VALVE ARE STILL AVAILABLE. MISSION TERMINATION
WILL BE REQUIRED IF ALL WATER DELIVERY REDUNDANCY IS LOST.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88 E-69
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/03/87             HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT   FLIGHT: 3/2R
MDAC ID: 15338             ABORT: /NA

ITEM: OWDA - FILL SWITCH
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: S.K. SINCLAIR SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) OPERATIONAL WATER DISPENSER
3) FILL SWITCH
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LOCATION: CREW MODULE
PART NUMBER: SED48101600

CAUSES: CONTAMINATION, MECHANICAL SHOCK

EFFECTS/RATIONALE:
The OWDA FILL SWITCH FAILING CLOSED WILL RESULT IN NO WATER FLOW
AFTER THE INITIAL WATER PULSE WHICH OCCURRED WHEN THE BUTTON
FAILED. THE BYPASS VALVE AND THE CONTINGENCY WATER DISPENSER ARE
STILL AVAILABLE.

REFERENCES: JSC-12770, SFOM VOL 12, JSC-20365, SED48101600

REPORT DATE 02/12/88 E-70
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/04/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 15403

ITEM: CWDA - CONNECTION TO ORBITER
FAILURE MODE: UNABLE TO MAKE CONNECTION

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) CONTINGENCY WATER DISPENSER
3) CONNECTION TO ORBITER

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LOCATION: CREW MODULE
PART NUMBER: SED48101607

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
UNABLE TO CONNECT CWDA TO ORBITER WATER SUPPLY. THIS MEANS THE CWDA WILL NOT PROVIDE WATER TO THE CREW. IF ALL REDUNDANT METHODS OF WATER DELIVERY ARE LOST, MISSION TERMINATION WILL BE REQUIRED.

REFERENCES: JSC-20365, SED48101607

REPORT DATE 02/12/88 E-71
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/10/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16409

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

ITEM: TREADMILL QUICK DISCONNECT
FAILURE MODE: JAMMED/Fails to RELEASE

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) TREADMILL
3) QUICK DISCONNECT
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LOCATION: CREW MODULE
PART NUMBER: 10131-10031-02

CAUSES: CONTAMINATION, MISHANDLING/ABUSE

EFFECTS/RATIONALE:
CANNOT REMOVE TREADMILL FROM: (1) LI OH DOOR FOR REINSTALLATION OF CREW SEAT; (2) MIDDECK FORWARD FLOOR TO ACCESS LOCKERS WITH CRITICAL EQUIPMENT.

REFERENCES: JSC-12770, SFOM VOL 12, 10131-10031

REPORT DATE 02/12/88 E-72
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 12/10/87
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16410

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

ITEM: TREADMILL MONITOR BATTERIES
FAILURE MODE: OPEN (ELECTRICAL), DEPLETED POWER

LEAD ANALYST: S.K. SINCLAIR
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) TREADMILL EXERCISER ASSEMBLY
3) PHYSIOLOGICAL MONITOR
4) BATTERIES
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CREW MODULE
PART NUMBER: 10131-10031

CAUSES: CONTAMINATION, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
THE TREADMILL'S PHYSIOLOGICAL MONITOR WILL BE INOPERATIVE DUE TO LOSS OF BATTERY POWER. TREADMILL WILL STILL FUNCTION WITHOUT MONITOR.

REFERENCES: JSC-12770, SFOM VOL 12, 10131-10031

REPORT DATE 02/12/88 E-73
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/11/88  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 3/1R
MDAC ID: 16512  ABORT: /NA

ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) ADJUSTMENT
MECHANISM
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: H. SAXON  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) COAS
3) ADJUSTMENT MECHANISM
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LOCATION: CREW MODULE
PART NUMBER:

CAUSES: MISHANDLING/ABUSE, PIECE-PART FAILURE

EFFECTS/RATIONALE:

REFERENCES:

REPORT DATE 02/12/88  E-74
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/11/88  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 3/3
MDAC ID: 16513  ABORT: /NA

ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT MOUNT ASSEMBLY
FAILURE MODE: SEAT FAILS TO ADJUST UP OR DOWN

LEAD ANALYST: H. SAXON  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) COAS
3) AFT MOUNT ASSEMBLY
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REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: CREW MODULE
PART NUMBER:

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE
EFFECTS/RATIONALE:

REFERENCES:

REPORT DATE 02/12/88  E-75
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/11/88  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT: 2/IR
MDAC ID: 16514  ABORT: /NA

ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT MOUNT
ASSEMBLY
FAILURE MODE: SEAT FAILS TO ADJUST UP OR DOWN

LEAD ANALYST: H. SAXON  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) COAS
3) AFT MOUNT ASSEMBLY
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CRITICALITIES

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LOCATION: CREW MODULE
PART NUMBER:

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE
EFFECTS/RATIONALE:

REFERENCES:

REPORT DATE 02/12/88 E-76
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/11/88
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16515

HIGHEST CRITICALITY
HDW/FUNC

FLIGHT: 3/3
ABORT:/NA

ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT MOUNT ASSEMBLY
FAILURE MODE: SEAT FAILS TO ADJUST BACKWARD AND FORWARD

LEAD ANALYST: H. SAXON

SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) COAS
3) AFT MOUNT ASSEMBLY

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LOCATION: CREW MODULE
PART NUMBER:

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE
EFFECTS/RATIONALE:

REFERENCES:

REPORT DATE 02/12/88 E-77
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/11/88
SUBSYSTEM: CREW EQUIPMENT
MDAC ID: 16516

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

ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT BRACKET ASSEMBLY
FAILURE MODE: SEAT FAILS TO ADJUST UP OR DOWN

LEAD ANALYST: H. SAXON
SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) COAS
3) AFT BRACKET ASSEMBLY
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LOCATION: CREW MODULE
PART NUMBER:

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE
EFFECTS/RATIONALE:

REFERENCES:

REPORT DATE 02/12/88 E-78
INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 1/11/88  HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: CREW EQUIPMENT  FLIGHT:  2/1R
MDAC ID: 16517  ABORT: /NA

ITEM: CREWMAN OPTICAL ALIGNMENT SIGHT (COAS) AFT BRACKET ASSEMBLY
FAILURE MODE: SEAT FAILS TO ADJUST BACKWARD AND FORWARD

LEAD ANALYST: H. SAXON  SUBSYS LEAD: S.K. SINCLAIR

BREAKDOWN HIERARCHY:
1) CREW EQUIPMENT
2) COAS
3) AFT BRACKET ASSEMBLY
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LOCATION: CREW MODULE
PART NUMBER:

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE

EFFECTS/RATIONALE:

REFERENCES:

REPORT DATE 02/12/88  E-79
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

1  IOA recommends deleting the IOA failure mode.
### NASA FMEA to IDA Worksheet Cross Reference / Recommendations

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