| NAME P/N QTY | CRIT | FAILURE MODE & CAUSES | FAILURE EFFECT | RATIONALE FOR ACCEPTANCE |
|---|---|---|---|---|
| | | 127FM03A | | |
| FILTER, COOLANT LOOP, ITEM 127<br>---<br>SV778543-3<br>(1)<br><br>OR<br>---<br>SV805180-1<br>(1) | 2/1R | External water leakage.<br><br>Housing seal failure. | END ITEM:<br>Water leakage from internal passageway to ambient.<br><br>GFE INTERFACE:<br>Depletion of the water reservoir to ambient. Loss of cooling. Possible helmet fogging.<br><br>MISSION:<br>Terminate EVA when the water supply drops below CWS limits.<br><br>CREW/VEHICLE:<br>None for single failure. Possible loss of crewman with loss of SOP.<br><br>TIME TO EFFECT /ACTIONS:<br>Minutes. If there is insufficient cooling water to permit return, open purge valve to activate the SOP.<br><br>TIME AVAILABLE:<br>Minutes.<br><br>TIME REQUIRED:<br>Seconds.<br><br>REDUNDANCY | A. Design -<br>(P/N SV778543 and P/N SV805180):<br>External leak is through radial O-ring seal (Viton material). Seal dimensions and rigidness of assembly provide squeeze under all load conditions. Fluid temperature and pressure are not extreme. The water is from 35 degrees F to 120 degrees F. Maximum operating pressure is 28.1 psid.<br><br>B. Test -<br>(P/N SV778543 and P/N SV805180):<br>Component Acceptance Test -<br>An external leakage test is performed on the filter per AT-E-127/128. With the filter pressurized to 42.8 - 43.8 psia it is submerged in water for a 5 minute minimum test period. No visible external leakage is allowed.<br><br>(P/N SV778543 and P/N SV805180):<br>PDA Test -<br>A combined water circuits leakage test is run per SEMU-60-010. In this test the water circuits are pressurized to 15.7 - 15.9 psig with water for 60 minutes minimum. Leakage must not exceed 6 scc/hr.<br><br>Certification Test -<br>Certified for a useful life of 15 years or 328 hours. (ref. EMUM-583, EMUM-680).<br><br>The PLSS coolant loop subsystem is certified for the 42.2 psid proof pressure because the lowest calculated safety factor for yield is 6.7 for Item 123 at the 28.1 psid maximum operating pressure.<br><br>C. Inspection -<br>(P/N SV778543 and P/N SV805180):<br>Cause - Housing and seal failure.<br>The filter cover and valve housing sealing interfaces are 100% inspected to meet dimensional and surface finish requirements.<br>The filter housing O-seal is 100% inspected to meet dimensional and surface finish requirements.<br><br>D. Failure History -<br>(P/N SV778543 and P/N SV805180):<br>None.<br><br>E. Ground Turnaround -<br>Inspected for non-EET processing per FEMU-R-001, SEMU H2O and O2 Servicing for Flight. None for EET processing.<br><br>F. Operational Use -<br>(P/N SV778543 and P/N SV805180):<br>Crew Response -<br>EVA: Failure probably not detectable unless water is visually detected or failure message is annunciated. In either case terminate EVA when CWS data confirms loss of water.<br>Training -<br>Standard training covers this failure mode.<br>Operational Considerations - |

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| | | | SCREENS:<br>A-PASS<br>B-PASS<br>C-PASS | RTDS allows ground monitoring of EMU systems.<br>EVA check list procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define loss of EMU for loss of thermal control. |

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-127 PUMP INLET FILTER

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____ 3/27/02
HS - Project Engineering

Approved by: _____ 4/30/02
NASA - S&MA/SM

_____
HS - Reliability

_____
NASA - EMU/SSM

_____
HS - Engineering Manager

_____
NASA - S & MA

_____
NASA - MOD

_____
NASA - Crew

_____
NASA - Program Manager