CIL
EMU CRITICAL ITEMS LIST

12/24/91 SUPERSEDES 10/31/90 ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
CONTAMINANT CONTROL CARTRIDGE, ITEM 480 --- SV792600-00 (1)	1/1	480EM07: External gas leakage beyond EOP makeup capability. CAUSE: Housing weld fracture.	END ITEM: PLSS gas leakage to ambient. SYE INTERFACE: Depletion of primary O2 supply and EOP, Rapid depressurization of EMU. MISSION: Abort EVA. CREW/VEHICLE: Possible loss of crewman.	A. Design - The Contaminant Control Cartridge (CCC) presently exists in three basic configurations. The most current configuration (SV792600) is made entirely of AA2219 - T8 and has one variation which has a 6061 - T6 aluminum alloy perforated plate substituted for the usual AA2219-T8 plate. The third configuration (SV767790), the original version, is fabricated of 6061-T6 aluminum. The maximum stress occurs in a weld at the flow panel center spanner joint. The current version (SV792600) has a safety factor of 4.4 at 5.5 psid, the vent loop maximum failure pressure, based on the ultimate strength of a welded, totally AA2219 joint. The safety factor for the current version (SV792600) with the 6061-T6 aluminum plate is 3.1 based on ultimate strength. The safety factor for the original, all AA6061-T6 version of the CCC is 2.3 based on ultimate strength. Safety factor values are slightly conservative since the CCC deforms prior to a rupture or leakage failure due to the ductile materials of construction. B. Test - PDA Test - An external leakage test is performed per SEMU-60-003 in which leakage from the item must not exceed 10 scc/hr when the item is pressurized to 6.0-7.0 psig with oxygen. A proof pressure test is performed per SEMU-60-003. The vent loop is pressurized to 10.5 psig with oxygen or nitrogen and no deformation of unit is allowed. Certification Test - The item completed 5,200 installation cycles with the same set of O-rings during 4/84 which fulfilled the cycle certification requirement of 5,130. The item completed the 15 year structural vibration and shock certification requirement during 11/85. No Class I ECI's have been incorporated since this configuration was certified. C. Inspection - Fluorescent penetrant inspection is performed to detect any surface defect in the welds and the parent metal of the cartridge. X-ray inspection is also performed to detect cracks, voids of other irregularities in the welds. A visual inspection is performed during component processing and

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	1/1	ABORTOFF:		during EDF and final inspection of PGA per SEMU-60-005 to verify that the canister is not cracked.

G. Failure History -
None.

E. Ground Turnaround -
Tested for leakage per SEMU-A-001 CCC, External Leakage Check.

F. Operational Use -
Crew Response -
EVA: Abort EVA.
Training - Standard EMU training covers this failure mode.
Operational Considerations - Reference Loss/Failure Flight Rules; define EMU as lost if unable to maintain sufficient pressure. EVA checklist and EDF procedures verify hardware integrity and systems operational status prior to EVA. EMU CWS provides readout on EMU status. Real Time Data System allows ground monitoring of EMU systems.