

CIL
 EMU CRITICAL ITEMS LIST

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12/24/94 SUPERSEDES 12/24/93

ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
DCM ELECTRONICS, ITEM 350 ----- SV792291-27 (1)	2/2	350FM23: Loss of CL2V (Item 171) Electrical Power. CAUSE: Electronic component failure, faulty solder joint failure, broken connection output printed circuit traces shorts to ground.	END ITEM: Loss of power to Item 171. GFE INTERFACE: Unable to change position of 171 valve. If closed, loss of cooling loop deges capability. May not be able to start pump. MISSION: Terminate EVA prep. CREW/VEHICLE: None.	A. Design - Semiconductor failure is minimized through the use of high reliability components. Established reliability capacitors (Level S) and resistors (Level R) are used and are qualified to the requirements of their respective MIL specs and thermal shocked per condition B of MIL-STD-202 Method 107. The transistors and diodes are qualified to the requirements of MIL-8-19500 and receive the burn-in of JANIXV level parts per the applicable methods, 1038, 1039 and 1040, of MIL-STD-750. The electronic components are operating within the power derating requirements of SVHS 7804. The printed circuit boards are polyimide per MIL-P-13949 Type DI and manufactured per SN-P-0006. Parts mounting and soldering is per NSFC--STD-136 and MM5300, 4 (3A-1). The board assemblies are hard mounted to the DCM case to provide a thermal transfer path between the board heat sinks and the case to direct heat away from the electronic components. The board assemblies are also conformal coated per MIL-A-46146 (Dow Corning RTV 3140) for environmental protection. All wiring used in the DCM is M22759/11 (teflon insulated). Soldering is per MM5300, 4 (3A-1) and wire crimping is per SVHS 4909 (based on MSC-SPEC-B-1A1). All wires are strain relieved. Electrical connectors are environmentally sealed to prevent damage due to contamination and humidity. B. Test - In-Process Test - The DCM electronics assembly is tested during initial build-up: at the board assembly level, after the PC boards have been interwired, and after installation of the boards wiring, and after installation of the front cover. These tests consists of continuity through the switches and wiring, voltage checks, functional check of all current limiters, and full operation of the DCM electronics. The tests insure proper operation of the DCM electronics. PCA TEST - Vibration testing per SEMU-60-015 followed by continuities and full function, testing verifies the integrity of the solder joints and crimp connections in the DCM. The random vibration level for this test is 6.6 grms for a duration of 1 minute per axis for each of the three orthogonal

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	2/2	350FM23:		
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strain relief. The DCM is internally inspected after installation of the circuit boards and wiring to insure no damage has occurred during assembly.

D. Failure History -
None.

E. Ground Turnaround -
Operation of current limiter is verified per FEMU-R-001,
Water Servicing, Leakage, and Gas Removal.

F. Operational Use -
Crew Response - PreEVA: No response required if pump startup and coolant flow can be initiated. If cooling insufficient, troubleshoot using pump priming valve. If cooling still insufficient EMI go for SCU without fan. PostEVA: No response, single failure undetectable by crew or ground.
Training - Standard training covers this failure mode.
Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define go/no go criteria related to EMI CNS.