NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
ELECTRICAL POWER HARNESS, ITEM 151 --- SV789151-4 (1)	2/2	151FM01: Electrical open or short in coolant loop isolation valve (CL1V) open/close lines. CAUSE: Cable chafing against connector shell or shield. Improper connector strain relief. Faulty connection between connector and lead wires.	END ITEM: Electrical open or short to ground in CL1V open/close lines. These lines are current limited to 0.7 +/- 0.2 amps in the DCM. GFE INTERFACE: Loss of power to CL1V. Unable to change position of Item 171 valve. Loss of cooling loop degas capability. May not be able to start pump with valve closed. MISSION: Terminate EVA with crew discomfort, (hot). CREW/VEHICLE: None.	A. Design - Open and short circuits in any of the circuits in the Item 151 harness are minimized by the following: Conductors are hard potted in Stycast 2651 in the area that they interface with the metal backshells to minimize their movement and chance of shorting to the backshell. The conductors are strain relieved at the connector/harness interface with a molded rubber backshell. This minimizes the effects of cable tension on the individual conductors. Conductors are sheathed within a woven Nomex outer layer. This holds the cables together to share any loading. Each connector/adapter ring interface is locked in place to prevent rotation by a mechanical and adhesive lock. #22 and #26 Teflon insulated wires provided electrical and mechanical properties to prevent wire breakage and to help prevent shorting. Each connector/cable interface is strain relieved by a molded rubber boot that is molded in place to prevent cable kinking. Wire crimping per SVS84909 (based on MIFC-Spec-G-1A). B. Test - Component Acceptance: The harness is acceptance tested per the following tests of AI-EMU-151 to insure there are no workmanship problems which would cause open or short circuits. Pull Test - This test subjects each connector/harness interface to a specific pull test (9 pounds) designed to exceed any stress encountered in actual use. The insulation resistance between each conductor and the ground circuit is measured during the test to insure there is no shorting. The test is followed by a continuity check of each conductor path to insure there are no open circuits. Continuity Test - The resistance of each circuit is measured to insure there are no open circuits or high resistance paths. Insulation Resistance/Dielectric Strength Testing - The harness is tested for short circuits or low resistance paths between each conductor to the shield circuit(s) and between each conductor to each other conductor by insulation resistance and dielectric strength measurements at 200 VDC and 200 VAC respectively. PDA Test -

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	2/2	15)PART:		An open or short circuit in the coolant loop isolation valve (CLIV) open/close lines would be detected during the leakage reserve to primary water tank portion of PLSS PDA Testing per Para. 19.B of SEMU-68-010. Certification Test - This item completed the 85 year structural vibration and shock certification requirements during 98/85. EC's 42806-527-2 (insulation resistance check during Suit Test), and 42806-665 (remove crimp splices) have been incorporated and certified by test since this configuration was certified. C. Inspection - During harness manufacturing, the following inspections are performed: Visual inspection of conductors prior to potting operations to insure there are no damaged conductors and that the conductors are routed properly. Visual inspection of the harness prior to and after rubber boot molding process to insure there are no damaged conductors which could cause an open short circuit. In-process electrical checkout of the harness before and after potting and molding to insure there are no open or short circuits. Visual inspection of the conductors prior to application of the outer sheath to insure there are no damaged conductors that could cause an open or short circuit. Connector contact crimp samples are made prior to and after crimping and subjected to pull testing to insure the crimping tools are operating properly. This insures there will not be any high resistance problems at the contacts. D. Failure History - J-EMU-151-004 (6-12-85) J-EMU-151-005 (6-12-85) - Both failures occured during an ETA Airlock Power Supply Functional Test. The failures were caused by a short circuit between the EMU power/battery sense (+) line and case ground (connector body). The failure caused the suit return line in

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	2/2	153/MH1:		the BCM to fuse open. The failure investigation found that a crimp within the molded backshell was not sufficiently covered by shrink tubing. The exposed portion of the crimp was allowed to come with the connector body. Corrective Action: Class I EC 42886-527-2 created the SV789151-3 harness configuration by adding a connector pull test requirement to the acceptance test requirements. Class I EC 42806-865 created the SV789151-4 harness configuration by eliminating the two crimp splices in the P9 connector, to prevent them from shorting to case. E. Ground Turnaround - Tested per PEMU-8-001, gas removal verification. F. Operational Use - Crew Response - Pre-EVA: Trouble shoot problem, if no success, consider third EMU if available, otherwise EMU is go for EVA. Training - Standard training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and system operational status prior to EVA. Flight rules define go/no go criteria related to EMU thermal control.