


NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
JUMPER HARNESS, ITEM 391 ----- SV821755-1 (1)	2/2	391FM12 Electrical open or short in feedwater open/close lines. Cable chafing against connector shell or shield. Improper connector strain relief. Faulty connection between the connector and the lead wires, insulation breakdown, conductor severed, contact resistance.	END ITEM: Electrical open or short to ground in feedwater open/ close lines. These lines are current limited to 0.7 +/- 0.2 amps in the DCM. GFE INTERFACE: Loss of power to 137 valve. Unable to change position of feedwater valve (137). If closed, no cooling or dehumidificati n available. MISSION: Terminate EVA. Loss of EMU. CREW/VEHICLE: None for single failure TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - Open and short circuits are minimized by the following: Each connector/adaptor ring interface is locked in place to prevent rotatio a mechanical lock. #22 AWG Teflon insulated wires and connector provide electrical conduction and insulation properties. Connector pins are at 56. derated temperature and 6.9% of derated voltage, and wire is at 12.4% of de current. The convoluted tubing provides an additional layer of insulation t prevent shorts between the EMI braid and any internal unshielded conductors woven Halar sheath is assembled over the internal cables to provide protect from abrasion and impact. Connector pins are insulated by a polyphenylene sulfide insert. The P3 connector backshell housing has internal edges blenc smooth to prevent cable chafing. Strain relief is provided by the combinati convolute tubing, metal EMI braid, and 0.5" extra cable length. The braided items are secured by a band strap at each connector/cable interface. The convolute tubing is threaded into the connectors. Wire crimping is performe SVHS4909 (based on MSFC Spec-Q-1A). B. Test - Component Acceptance Test - The 391 harness is subjected to acceptance testing per AT-E-391 prior to fi acceptance to ensure there are no workmanship problems that could cause an or short circuit. Each connector/harness interface is subjected to a 9-lb. test. The insulation resistance between each conductor and the ground circ is measured during this test to ensure there are no intermittent shorts and verify the integrity of the harness strain relief. A continuity test is performed to measure the resistance of each circuit to ensure there are no circuits or high resistance paths. The insulation resistance and dielectric strength between each conductor and the shield ground is measured to ensure there are no shorts. PDA Test - The feed-water open/close lines are checked during DCM PDA testing per SEMU 015 para. 4.0 (Electrical Testing). Certification Test - Certified for a useful life of 15 years (ref. EMU1-13-046). C. Inspection - To ensure that there are no workmanship problems which could cause an open short circuit in the harness conductors, the following inspections are made Contact crimp samples are made prior to start of crimping and at the conclusion of crimping and pull tested to ensure the crimp tooling is opera properly. All crimp terminations are inspected for defects. Harness cables conductors are visually inspected prior to assembly to ensure there are no defects which could cause an open or short due to workmanship. Electrical l test is performed to verify ground path through various points on the harn In-process and final electrical checkout of the harness (conductor continuity, dielectric strength, and insulation resistance tests) are perfo to ensure there are no open/short circuits. D. Failure History - None.

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		391FM12		<p>E. Ground Turnaround - Tested per FEMU-R-001, Item 137 Feedwater Shutoff Valve Functional Verification</p> <p>F. Operational Use - Crew Response -PreEVA: Trouble shoot problem. Consider third EMU if available. If no success continue EVA prep. EVA: When CWS data confirms loss of sublimator pressure due to failed close valve and cooling is not adequate, terminate EVA. When failed open valve is detected by water in airlock during repress, perform water dump of feedwater tanks.</p> <p>Training - Standard training covers this failure mode.</p> <p>Operational Considerations - Flight rule A15.1.2-2 of "Space Shuttle Operational Flight Rules", NSTS-128 defines go/no go criteria related to EMU thermal control. Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.</p>

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-391 JUMPER POWER HARNESS
CRITICAL ITEM LIST (CIL)
EMU CONTRACT NO. NAS 9-97150

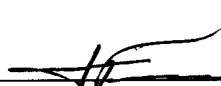
Prepared by: 
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Approved by:  5/24/02
NASA - SSA/SSM
LSS


HS - Reliability

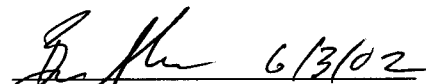
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