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EMU CRITICAL ITEMS LIST

Page: 1
Date: 11/29/93

12/24/93 SUPERSEDES 12/24/91

ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
FEEDWATER VALVE SWITCH, ITEM 367 ----- SV767795-J (1)	2/2	367FMO6: Electrical short across output leads. CAUSE: Contamination, faulty wiring.	END ITEM: Simultaneous power to both "OPEN" and "CLOSE" 137 valve terminals causing a short to ground across the 0.7 amp current limiter. OPE INTERFACE: The feedwater valve current limiter would trip open. Loss of capability to change feedwater valve position during EVA. 137 valve remains in open position. MISSION: Unable to place sublimator "OFF LINE" at end of EVA or shut off feedwater supply during EVA. Water leakage to ambient through sublimator. CREW/VEHICLE: None.	A. Design - Switching mechanism and contacts are encased in a hermetically sealed case backfilled with dry nitrogen. Each switch position has dual contacts for redundancy. The external lead wires are potted for strain relief. Contact is accomplished through a roller type contact. This keeps switching forces to a minimum. B. Test - Component Acceptance Test - Vendor acceptance tests include 500 actuation cycles, contact resistance, insulation resistance, and dielectric withstanding voltage tests. In-Process Test - Switch operation and continuity are verified during in-process tests during DCN Item 350 assembly. PDA Test - Proper operation is verified during DCN PDA which includes continuity, functional, and operating torque tests. The switch is vibrated and exposed to thermal cycles during PDA as part of the DCN. Certification Test - The item completed the 15 year structural vibration and shock cert requirements during 10/83. The item is cycle certified by similarity to the Item 368 switch which has completed 127,000 cycles during 8/83. This is 86 times the Item 367 cycle cert requirement of 1,472. C. Inspection - The external lead wires are inspected for damage as part of the source inspection for the part and again during assembly of the DCN. To preclude failure due to internal contamination, the switches are assembled by the vendor in a Class 100,000 clean room. The switches are flushed internally using chloroethane 80 and Genesolve D to remove contaminants prior to case welding. After welding the switches are vacuum baked and back filled with O2 to a pressure of 3-5 psig and sealed. Leak checks are performed during subsequent processing to verify seal integrity. Two x-ray inspections are performed, prior to run-in cycling and

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12/24/93 SUPERSEDES 12/24/91

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Page: 2
Date: 11/29/93

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	2/2	367M06s		<p>after vibration, to verify absence of weld splatter and loose pieces, and to verify contact alignment.</p> <p>D. Failure History - None.</p> <p>E. Ground Turnaround - Tested per FEMU-R-001, PLSS & BCS electrical Checkout, 137 Activation.</p> <p>F. Operational Use - Crew Response - EVA: When CDS data confirms loss of feedwater and cooling is insufficient, terminate EVA. Training - Standard EMU training covers this failure mode. Operational Considerations - Flight rules define go/no go criteria related to thermal control.</p>