

CEL
 ENU CRITICAL ITEMS LIST

Page: 1
 Date: 11/10/94

12/24/94 SUPERSEDES 12/24/92

ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
POWER MODE SELECTOR SWITCH, ITEM 364 ----- SV778596-6 (1)	2/2	364FNU3: Power mode switch fails in SCU position. (11) CAUSE: Contact welding caused by arcing or by exposure to vacuum, damage to switch actuator lever.	END ITEM: Switch remains in SCU position when toggle placed in battery position. GFE INTERFACE: Loss of battery power to radio when in battery mode. Failure would not be detected until the SCU is disconnected. MISSION: Terminate EVA. Loss of use of one EMI. CREW/VEHICLE: None.	A. Design - Each of the three switches is coated in a dry nitrogen filled hermetically sealed case. The switches are per MIL-8-8805/46 with that the 10 amp contacts are silver plated. Switch contacts rated for 10 amperes. Actual current flow is 3.8 amperes. The switch is designed to withstand a toggle force of 25 lbs. without degradation in subsequent performance. The ball socket of the toggle pivot is greased (Braycote 501) prior to assembly. B. Test - Component Acceptance Test - Switch operation and continuity are verified during vendor acceptance tests. The switch is also subjected to 500 run-in cycles and an axial pull test on the handle to verify that it will not come loose during normal use. In-Process Test - Operation and integrity of the switch are verified during four separate in-process tests during initial item 350 assembly. These tests include continuity and output voltage. The switch is cycled during these tests. PDA Test - The switch is subjected to Acceptance/PDA testing as part of item 350. Tests include continuity, operating torque, vibration, thermal cycling, and thermal vacuum. The switch is also cycled during item 350 Acceptance/PDA electrical functional tests. Certification Test - The item completed 5,464 inductive and 8,536 resistive cycles during 1/81 which fulfilled the cycle certification requirement of 5,464 and 8,536 respectively. Class 1 Engineering change 53806-386 (toggle handle pull test) has been incorporated since this configuration was certified. C. Inspection - To preclude failure due to internal contamination, the switches are assembled by the vendor in an environmentally controlled room. Assembly and processing is per

12/24/94 SUPERSEDES 12/26/92

ANALYST:

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
	2/2	364FND3:		<p>MIL-S-8805/46. The switches receive in-process cycling and leak checks. The item 364 is x-ray inspected for acceptability of brazing.</p> <p>D. Failure History - J-EMU-300-006 (10-18-83) The BITE light failed to turn on upon power switchover during PIA tests. The outage was found to be caused by a mechanical failure of the Power Mode Switch (364) which prevented proper power switchover. EC 42806-364 added a pull test to the 364 vendor test to insure the switch toggle arm would not come loose during normal use. This EC created the -2 switch configuration. Certified on 1/84 per SEMU-540.</p> <p>E. Ground Turnaround - Switches are tested during ground turnaround per the following FEMU-R-001 sections: EMU Vacuum Chamber Run, EMU Checkout in Orbiter, Orbiter Power Interface, and SEMU Comm & Biond Check</p> <p>F. Operational Use - Crew Response - PreEVA: trouble shoot problem, if no success, consider third EMU if available. Otherwise, EMU go for SCU standby. EVA, Terminate EVA. Training - Standard training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Flight rules require that EVA be terminated if two-way communication between each EV crewmember and orbiter, either direct or through relay, is unavailable. Real time Data System allows ground monitoring of EMU systems.</p>