

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2111 -2 REV:06/15/88
 ASSEMBLY : D & C PANEL R2 CRIT. FUNC: 1R
 P/N RI : ME452-0102-7203 CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 3 EFFECTIVITY: X X X
 :THREE PHASE(S): PL X LO X OO DO LS
 :

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES J BROWN DES A. Brown EPDC SSM [Signature] 6/17/88
 REL J. Kamura 6/27/88 MPS SSM [Signature] 2/3/88
 QE D. Masai 6/27/88 EPDC REL [Signature] 7/1/88
 MPS REL [Signature] 6/3/88

ITEM:
 SWITCH, TOGGLE (TWO POLES, THREE POSITIONS), HELIUM SUPPLY ISOLATION VALVE B (LV2/4/6).

FUNCTION:
 PROVIDES MANUAL CONTROL OF POWER TO HELIUM SUPPLY ISOLATION VALVE B. 32V73A2S12, 13, 14.

FAILURE MODE:
 CONTACT-TO-CONTACT SHORT (BOTH "CLOSE" POLES).

CAUSE(S):
 PIECE PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY.

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

- (A) INADVERTENT SWITCH CLOSE COMMAND TO HELIUM SUPPLY ISOLATION VALVE B (LV2/4/6) PROVIDING INHIBIT SIGNALS TO HDCs.
- (B) INADVERTENT CLOSING OF THE HELIUM SUPPLY ISOLATION VALVE B.
- (C.D) FIRST FAILURE - NO EFFECT.

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- (E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.
TIME FRAME - ENGINE OPERATION.
1) CONTACT-TO-CONTACT SHORT (BOTH "CLOSE" POLES) CAUSING HELIUM SUPPLY ISOLATION VALVE B (LV2/4/6) TO CLOSE.
2) PARALLEL HELIUM ISOLATION VALVE A (LV1/3/5) FAILS CLOSED.

FAILURES WILL RESULT IN LOSS OF HELIUM REQUIRED TO PERFORM CONTINUOUS PURGING OF HIGH PRESSURE OXIDIZER TURBOPUMP INTERMEDIATE SEAL CAVITY. THIS CAVITY IS BETWEEN TWO SEALS, ONE OF WHICH CONTAINS THE HOT, FUEL-RICH GAS IN OXIDIZER TURBINE AND THE OTHER CONTAINS THE LIQUID OXYGEN IN OXIDIZER TURBOPUMP. LEAKAGE THROUGH ONE OR BOTH SEALS COULD RESULT IN A CATASTROPHIC EXPLOSION IF ALLOWED TO ACCUMULATE. CONTINUOUS OVERBOARD PURGE OF THIS AREA PREVENTS THIS ACCUMULATION FROM OCCURRING. POSSIBLE LOSS OF CREW/VEHICLE.

DISPOSITION & RATIONALE:

(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE:

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION, V41AAO.015E, V41AAO.035E, V41AAO.055E EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.