

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2114 -2 REV:06/15/88

ASSEMBLY : AFT PCA-4,5,6	CRIT. FUNC: 1R
P/N RI : JANTXV1N4246	CRIT. HDW: 3
P/N VENDOR:	VEHICLE. 102 103 104
QUANTITY : 6	EFFECTIVITY: X X X
: SIX	PHASE(S): PL X LO X OO DO LS
:	

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <i>AWB</i> J BROWN	DES <u><i>D. Brown</i></u>	EPDC SSM <u><i>David L. ...</i></u>
REL <i>gdf</i> DEFENSOR	REL <u><i>J. Kemura 6/27/88</i></u>	MPS SSM <u><i>...</i></u>
QE <i>...</i> D MASAI	QE <u><i>J. Conner 6/27/88</i></u>	EPDC DES <u><i>...</i></u>
		MPS DES <u><i>...</i></u>
		QE <u><i>...</i></u>

ITEM:
DIODE, BLOCKING (1 AMP), HELIUM ISOLATION VALVE B (LV2/4/6) SWITCH OPEN COMMAND B OUTPUT.

FUNCTION:
CONDUCTS SWITCH MANUAL OPEN COMMAND FOR CONTROL OF POWER TO HELIUM SUPPLY ISOLATION VALVE B.
54V76A134A1CR4, A3CR3. 55V76A135A1CR4, A3CR3. 56V76A136A1CR4, A3CR3.

FAILURE MODE:
SHORT (END TO END).

CAUSE(S):
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

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

(A) LOSS OF ISOLATION BETWEEN MAIN BUS AND CONTROL BUS.

(B,C,D) NO EFFECT - FIRST FAILURE.

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- (E) 1R/3, 3 SUCCESS PATHS AFTER FIRST FAILURE.
TIME FRAME - ENGINE OPERATION.
- 1) DIODE SHORT (END TO END).
 - 2) ASSOCIATED SWITCH CONTACT SHORTS TO GROUND RESULTING IN LOSS OF ONE OF TWO POWER PATHS OF ISOLATION VALVE B.
 - 3) PARALLEL POWER PATH (RPC, DIODE) FAILS "OFF", RESULTING IN CLOSURE OF ISOLATION VALVE B.
 - 4) HELIUM SUPPLY 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.

FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE.

DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE:

REFER TO APPENDIX F, ITEM NO. 3 - DIODE, AXIAL LEAD.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION, V41AAO.015B,C; V41AAO.035B,C;
V41AAO.055B,C EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.