

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2118 -1 REV:06/15/88
 ASSEMBLY : AFT LCA-1, 2, 3 CRIT. FUNC: 1R
 P/N RI : MC477-0263-0002 CRIT. HDW: 2
 P/N VENDOR: VEHICLE. 102 103 104
 QUANTITY : 3 EFFECTIVITY: X X X
 THREE PHASE(S): PL X LO X CO DO LS
 :

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <u>JAB</u> J BROWN	DES <u>[Signature]</u>	EPDC SSM <u>[Signature]</u> 4/9/88
REL <u>JFP</u> DEFENSOR	REL <u>J Kimura</u> 6/27/88	MPS SSM <u>[Signature]</u> 6/2/88
QE <u>DMA</u> D MASAI	QE <u>[Signature]</u> 6/21/88	EPDC RM <u>[Signature]</u> 6/21/88
		MPS RM <u>[Signature]</u> 6/21/88

ITEM:
 CONTROLLER, HYBRID DRIVER (HDC), TYPE III, HELIUM ISOLATION VALVE A (LV1/3/5).

FUNCTION:
 CONDUCTS POWER TO HELIUM SUPPLY ISOLATION VALVE A (LV1/3/5).
 54V76A121J3(76), 55V76A122J3(76), 56V76A123J3(76).

FAILURE MODE:
 LOSS OF OUTPUT, FAILS TO CONDUCT, FAILS TO TURN "ON".

MODE(S):
 PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL STRESS, PROCESSING ANOMALY.

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY
 (A) LOSS OF POWER PATH TO HELIUM SUPPLY ISOLATION VALVE A (LV1/3/5).
 (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) HDC FAILS "OFF", CAUSING HELIUM SUPPLY ISOLATION VALVE A (LV1/3/5) TO CLOSE.
2) PARALLEL HELIUM ISOLATION VALVE B (LV2/4/6) 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 B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER.

(B) GROUND TURNAROUND TEST

MDM AND D&C CMD VERIF, V41AAO.010, V41AAO.030, V41AAO.050 EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.