SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS FMEA NO 05-6KA-2219 -2 REV:11/03/8

ASSEMBLY :AFT LCA 1,2
P/N RI :MC477-0261-0002
P/N VENDOR:
QUANTITY :4
:FOUR
:

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL LO X OO X DO X LS

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

PREPARED BY:		APPROVED BY:	APPROVED BY (NASA)
DES	D SOVEREIGN	DES	SSM
REL	J BEEKMAN	REL	REL
QE		QE	QE

ITEM:
HYBRID DRIVER CONTROLLER (HDC) TYPE I - LEFT AND RIGHT AFT RCS FUEL TAN
ISOLATION VALVE 3/4/5 A AND B LIMIT SWITCH TALKBACK AND LOGIC CIRCUITS.

FUNCTION:
NORMALLY OPEN TANK ISOLATION VALVES ARE CLOSED FOR RTLS ABORT AND SOME CROSS FEED OPERATIONS. UPON RECEIVING PROPER STIMULI FROM THE ASSOCIAT LEFT AND RIGHT FUEL TANK ISOLATION VALVE "CLOSED" LIMIT SWITCH, THE DRIVER CONDUCTS AND PROVIDES LOGIC INPUT TO AN ASSOCIATED DRIVER FOR PANEL TALKBACK INDICATION AND AN ASSOCIATED HYBRID RELAY FOR MOTOR VALV END OF TRAVEL CUTOFF. 54V76A121AR (J4-5, 115). 55V76A122AR (J4-5, 11

FAILURE MODE:
INADVERTENT OUTPUT, CONDUCTS PREMATURELY, INTERNAL SHORT.

CAUSE(S):
PIECE PART FAILURE, CONTAMINATION, MECHANICAL OR THERMAL SHOCK, VIBRATION.

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

(A) PROVIDES AN ERRONEOUS INPUT TO ASSOCIATED DRIVER.

(B) NO EFFECT - ASSOCIATED DRIVER REQUIRES DUAL LOGIC INPUT BEFORE END FUNCTION IS INITIATED. A SECOND RELATED FAILURE WOULD INHIBIT THE VALV CLOSING CAPABILITY. REQUIRES CREW ACTION TO CORRECT THE CONDITION.

(C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO DEPLETION OF RCS TANK PROPELLANT NEEDED FOR ENTRY OPERATIONS RESULTING FROM AN UNCONTROLLABLE THRUSTER LEAK. REQUIRES 3 OTHER FAILURES (ASSOCIATED HYBRID DRIVER, MANIFOLD VALVE, THRUSTER LEAK) BEFORE EFFECT IS MANIFESTED. FIRST FAILURE OF STRING NOT DETECTABLE IN-FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS.

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.

(B) GROUND TURNAROUND TEST
COMPONENT CHECKED OUT EVERY FLIGHT DURING GROUND TURNAROUND. THE TESTING CONSISTS OF CYCLING VALVE MANUAL SWITCHES AND/OR SENDING GENERAL PURPOSE COMPUTER (GPC) COMMANDS TO CYCLE VALVES OR HEATERS WHILE MONITORING VEHICLE INSTRUMENTATION TO DETERMINE IF COMPONENTS HAVE FAILED.

(E) OPERATIONAL USE
NO ACTION FOR FIRST FAILURE - NOT DETECTABLE. IF VALVE FAILS TO CLOSE, AVOID CROSSFEED/INTERCONNECT TO AFFECTED LEG. LOSS OF INTERCONNECT CAPABILITY MAY RESULT IN MISSION MODIFICATION.