SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - OMS   FMEA NO 05-6L -2258 -1   REV:10/30/87

ASSEMBLY :AFT MCA 1,2,3   CRIT. FUNC: 1R
P/N RI :JANTXV1N4246   CRIT. HDW: 3
P/N VENDOR:

QUANTITY :12	VEHICLE	102	103	104
:TWELVE	EFFECTIVITY:	X	X	X
:(THREE PER VALVE PAIR)	PHASE(S): PL	LO	OO	DO X LS

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

PREPARED BY:		APPROVED BY:	APPROVED BY (NASA):
DES	D SOVEREIGN	DES	SSM
REL	F DEFENSOR	REL 11-14-87	REL 12-9-87
QE	J COURSEN	QE	QE

EPDC SSM

ITEM:
DIODE, BLOCKING (1AMP), OMS LEFT AND RIGHT, FUEL AND OXIDIZER CROSSFEED ISOLATION VALVE A AND B RELAY "OPEN" CONTROL CIRCUITS. ("OPEN" MANUAL INPUT DIODE).

FUNCTION:
PROVIDES INPUT FROM THE "OPEN" MANUAL SWITCH TO THE "OPEN" HYBRID RELAY AND PROVIDES BLOCKING FROM THE "OPEN" MDM COMMAND TO THE "OPEN" MANUAL SWITCH FOR THE CONTROL OF THREE PHASE AC MOTOR THAT ACTUATES THE OMS LEFT AND RIGHT FUEL AND CROSSFEED ISOLATION VALVE A AND B. FOR OV-102: VALVE A; RIGHT - 56V76A116A2CR15, 79, 86; LEFT - 54V76A114A1CR19, 77, 78. VALVE B; RIGHT - 55V76A115A2CR13, 28, 29. LEFT - 55V76A115A1CR12, 13, 14. FOR OV-103 AND SUBSEQUENT: VALVE A; RIGHT - 56V76A116A2CR14, 71, 74; LEFT - 55V76A114A1CR61, 87, 88. VALVE B; RIGHT - 55V76A115A1CR58, 93, 94; LEFT - 55V76A115A1CR17, 25, 26.

FAILURE MODE:
OPENS, FAILS TO CONDUCT, HIGH RESISTANCE.
(COCKPIT SWITCH IN THE "OPEN" POSITION.)

CAUSE(S):
CONTAMINATION, THERMAL STRESS, MECHANICAL SHOCK, VIBRATION.

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

(A) LOSS OF REDUNDANCY -DEGRADATION OF MANUAL "OPEN" SWITCH ABILITY TO ENERGIZE THE AFFECTED AC "OPEN" MOTOR VALVE DRIVE CIRCUIT.

(B) FIRST FAILURE HAS NO EFFECT. REDUNDANT CONTROL CIRCUIT CAN APPLY POWER TO THE "OPEN" AC MOTOR VALVE CIRCUIT. A SECOND SIMILAR FAILURE WOULD PRECLUDE THE OPENING OF ONE OXIDIZER OR FUEL CROSSFEED ISOLATION VALVE.

(C,D) FIRST FAILURE HAS NO EFFECT.

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF CAPABILITY TO CONTROL CROSSFEED VALVES. REQUIRES THREE OTHER FAILURES (REDUNDANT RELAY FAILS TO CONDUCT, PARALLEL CROSSFEED VALVE FAILS TO OPEN, LOSS OF OTHER OMS ENGINE) BEFORE THE EFFECT IS MANIFESTED. INABILITY TO CROSSFEED PROPELLANT COULD RESULT IN INABILITY TO UTILIZE/DEPLETE PROPELLANT FROM OMS POD. FAILURE IS NOT DETECTABLE IN FLIGHT DUE TO LACK OF CREW VISIBILITY TO MCA STATUS MEASUREMENTS.

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.

(B) GROUND TURNAROUND TEST
V43CA0.070 - REDUNDANT CIRCUIT VERIFICATION (PERIODIC) - ORB/POD; PERFORMED FOR FIRST FLIGHT AND AT FIVE FLIGHT INTERVALS OR FOR LRU RETEST PER FIGURE V43Z00.000 OR FOR ORBITER DISRUPTED COPPER PATHS. FUNCTIONAL CHECKOUT OF AC MOTOR VALVE CONTROL CIRCUITS PER FIGURE V43CA0.070-2.

V43CA0.072 - REDUNDANT CIRCUIT VERIFICATION; PERFORMED EACH FLIGHT (AFTER FIRST FLIGHT). FUNCTIONAL CHECKOUT OF AC MOTOR VALVE CONTROL CIRCUITS PER FIGURE V43CA0.070-2.

(E) OPERATIONAL USE
NO ACTION FIRST FAILURE - NOT DETECTABLE: FOR FAILURE OF VALVE TO OPEN, USE PARALLEL VALVE.