SE TLE CRITICAL ITEMS LIST - ARBITER

SUBSYSTEM :R/RADAR & COM ANT DEPLOY FMEA NO 05-6EH-56004 -2 REV:05/21/90

ASSEMBLY :MID MCA 2 AND 4
P/N RI :JANTXV1N4246
P/N VENDOR:
QUANTITY :4
:FOUR (2 PER MCA)
:

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE EFFECTIVITY:	102	103	104
PHASE(S): PL	LO X	OO X	DO X LS

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

PREPARED BY:		APPROVED BY:	APPROVED BY (NASA):
DES	T BANHIDY	DES	SSM
REL 5-21-90	J RESSIA	REL 5-21-90	REL
QE	J COURSEN	QE 5-21-90	QE

EPDIC SSH:
EPDIC SSE:

ITEM:
DIODE, ISOLATION (1 AMP), KU-BAND ANTENNA DEPLOYMENT CONTROL CIRCUIT

FUNCTION:
PROVIDES SWITCH ISOLATION FOR LOGIC CIRCUIT TO DEPLOY HYBRID RELAY FO ENERGIZING MOTORS.
M-MCA-2, 40V76A118A1CR37, CR43
M-MCA-4, 40V76A120A1CR12, CR17

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) FIRST AND SECOND FAILURES - LOSS OF CIRCUIT ISOLATION PROTECTION FO THE "DEPLOY" HYBRID RELAYS ASSOCIATED WITH THE "DEPLOY/GND/STOW" SWITCH.

(B,C,D,E) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTE FOUR FAILURES (DIODE FAILS SHORT; THE SECOND REDUNDANT DIODE IN THE SAM MCA FAILS SHORT; THE FAILING "ON" OF THE MECHANICAL 3-PHASE POWE SWITCH, DRIVING THE KU-BAND DEPLOYED ASSEMBLY INTO THE RADIATOR, CAUSIN LOSS OF FREON COOLANT LOOP; AND LOSS OF REDUNDANT FREON COOLANT LOOP DURING POWERED FLIGHT, CAUSING LOSS OF ALL VEHICLE COOLING CAPABILITY.

FIRST FAILURE IS CONSIDERED AS NOT BEING READILY DETECTABLE IN FLIGH ALTHOUGH OPERATIONAL STATUS MONITORING EXISTS FOR THE AFFECTED HYBRI RELAYS. SUFFICIENT TIME MAY NOT BE AVAILABLE TO ALLOW CORRECTIVE ACTIO TO BE PERFORMED.

DISPOSITION & RATIONALE:
(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE:

(A-D) DISPOSITION AND RATIONALE
REFER TO APPENDIX F, ITEM NO. 3 - DIODE

(B) GROUND TURNAROUND TEST
"KU-BAND ANTENNA DEPLOY MOTOR 1 AND 2" VERIFIES THE INTEGRITY OF TH CIRCUIT CONTAINING THE DIODE FOR MOTORS 1 AND 2. DEPLOY MOTOR PERFORMANCE IS VERIFIED DURING IN-FLIGHT OPERATION. ON GROUND TESTIN WOULD BE ACCOMPLISHED WHEN A VALID VERIFICATION IS UNOBTAINABLE DURIN FLIGHT, OR FOLLOWING LRU REPLACEMENT. ALSO, SINGLE MOTOR OPERATION I VERIFIED EVERY FLOW: DEPLOY MOTOR 1/STOW MOTOR 2 IS VERIFIED ON OD FLOWS; AND DEPLOY MOTOR 2/STOW MOTOR 1 IS VERIFIED ON EVEN FLOWS.

(E) OPERATIONAL USE
THE FIRST TWO FAILURES ARE NOT DETECTABLE IN FLIGHT. DURING POWERE FLIGHT, THIRD FAILURE COULD CAUSE LOSS OF ONE FREON COOLANT LOOP REQUIRING EQUIPMENT POWER-DOWN TO MINIMIZE HEAT GENERATION AND LANDING A NEXT PRIMARY LANDING SITE (PLS). THE FOURTH FAILURE (LOSS OF REDUNDAN FREON COOLANT LOOP) COULD CAUSE LOSS OF CREW/VEHICLE.