FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: M5-6MB-2077-G-X

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC
REVISION : 9 09/09/92

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:	PANEL R1A2	V070-730276
SRU	:	RESISTOR	RWR80S1211FR

- PART DATA -

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
RESISTOR, CURRENT LIMIT, 1.2K OHM, 2 WATT - 02 MANIFOLD VALVE, TANKS 1 AND 2

REFERENCE DESIGNATORS: 32V73A1A2A1R2
: 32V73A1A2A1R6
: 32V73A1A2A1R10
: 32V73A1A2A1R16

QUANTITY OF LIKE ITEMS: 4
FOUR, TWO PER O2 MANIFOLD VALVE CIRCUIT

FUNCTION:
PROVIDES CURRENT LIMIT/CIRCUIT PROTECTION FOR THE CONTROL CIRCUIT OF 02 MANIFOLD ISOLATION VALVES 40V45LV011 AND 40V45LV021.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: M5-6MB-2077-G-01

REVISION# 9 09/09/92
SUBSYSTEM: ELECTRICAL POWER GENERATION - CRYO, GENERIC
LRU PANEL R1A2 CRITICALITY OF THIS
ITEM NAME: RESISTOR FAILURE MODE:1R2

FAILURE MODE:
OPEN

MISSION PHASE:
LO LIFT-OFF
OO ON-ORBIT
DO DE-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
: 103 DISCOVERY
: 104 ATLANTIS
: 105 ENDEAVOUR

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

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:
A)

B)
REDUNDANCY SCREEN "B" FAILS EVEN THOUGH THE FAILURE OF THIS RESISTOR IS DETECTABLE BECAUSE THE TIME FOR CORRECTIVE ACTION (ELECTRICAL LOAD RECONFIGURATION) EXCEEDS THE TIME TO EFFECT (MANIFOLD GROSS EXTERNAL LEAK STARVES TWO FCP'S DURING ASCENT/DESCENT).

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF ABILITY TO OPEN AFFECTED MANIFOLD VALVE AFTER INADVERTENT OR COMMANDED VALVE CLOSURE.

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(B) INTERFACING SUBSYSTEM(S):
SAME AS (A)

(C) MISSION:
(CRIT 2/2) POSSIBLE LOSS OF MISSION DUE TO ASSOCIATED MANIFOLD VALVE FAILING CLOSED RESULTING IN ONE TANK BEING ISOLATED TO A SINGLE FUEL CELL. MISSION TERMINATED WHEN THE OXYGEN IN THAT TANK IS CONSUMED.

(D) CREW, VEHICLE, AND ELEMENT(S):
FIRST FAILURE - NO EFFECT

(E) FUNCTIONAL CRITICALITY EFFECTS:
(CRIT 1R2) POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE FOLLOWING SCENARIO: 1) RESISTOR OPENS (VALVE REMAINS OPEN), AND 2) GROSS EXTERNAL LEAK STARVES TWO FCP'S (LOSS OF TWO FCP'S DURING ASCENT LOSES CREW/VEHICLE. LOSS OF A SECOND FCP DURING DESCENT LOSES CREW/VEHICLE IF INSUFFICIENT TIME IS AVAILABLE FOR AN ELECTRICAL LOAD RECONFIGURATION RESULTING IN THE INABILITY OF THE SINGLE REMAINING FUEL CELL TO SUPPLY ADEQUATE ELECTRICAL POWER.)

- DISPOSITION RATIONALE -

(A) DESIGN:
REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

(B) TEST:
REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

RESISTOR INTEGRITY IS FUNCTIONALLY VERIFIED DURING FLIGHT. PERFORM GROUND TURNAROUND TEST WHEN VALID VERIFICATION IS UNOBTAINABLE IN FLIGHT OR AFTER LRU REPLACEMENT.

(C) INSPECTION:
REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

(D) FAILURE HISTORY:
REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

(E) OPERATIONAL USE:
NO CREW ACTION AFTER FIRST FAILURE.

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NUMBER: M5-6MB-2077-G-01

- APPROVALS -

PRODUCT ASSURANCE MGR	T. J. EAVENSON	T.J. Eavenson 9/15/92
PRODUCT ASSURANCE ENG	T. K. KIMURA	T.K. Kimura 9/14/92
DESIGN ENG TEAM LEADER	G. M. ANDERSON	G.M. Anderson 9.15.92
DESIGN ENGINEERING	T. D. NGUYEN	T.D. Nguyen 9/15/92
NASA RELIABILITY		[illegible] 12/16/92
NASA SUBSYSTEM MANAGER		[illegible] 12/16/92
NASA EPD&C RELIABILITY		David Lopez for S. Woodard 12/14/92
NASA QUALITY ASSURANCE		NTE KO [illegible] 12/9/92
NASA EPD&C SUBSYS MGR		[illegible] for F. Abair 12/8/92