FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE
NUMBER:05-6QA-BCB2 -X

SUBSYSTEM NAME: EPD&C - MEDS

REVISION: 0 01/19/95

PART DATA

	PART NAME **VENDOR NAME**	**PART NUMBER** **VENDOR NUMBER**
LRU	: PANEL R15	VO70-730342
SRU	. BREAKER, CIRCUIT	MC454-0026-2030

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
BREAKER, CIRCUIT, 3A, ADC POWER CIRCUIT

REFERENCE DESIGNATORS: 32V73A15CB77
32V73A15CB80

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:
PROVIDES CIRCUIT PROTECTION BETWEEN THE MAIN DC BUS VOLTAGE 28 VDC TO ANALOG-TO-DIGITAL CONVERTER. ADC'S 1A AND 2A SHARE ONE CIRCUIT BREAKER, AND ADC'S 1B AND 2B SHARE ONE CIRCUIT BREAKER.

REFERENCE DOCUMENTS: VS70-730182D
SSD90D0009B, CP#1
MC409-0185D, AMENDMENT E01
SSD92D0643D, CP#2

FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE
NUMBER: 05-6QA-BCB2-01

REVISION#: 1 04/26/98

SUBSYSTEM NAME: EPD&C - MEDS
LRU: PANEL R15
ITEM NAME: BREAKER, CIRCUIT

CRITICALITY OF THIS FAILURE MODE: 1R3

FUNCTIONAL CRITICALITY/ REQUIRED FAULT TOLERANCE/ACHIEVED FAULT TOLERANCE: 1R/2/4

FAILURE MODE:
FAILS OPEN

MISSION PHASE:

PL	PRE-LAUNCH
LO	LIFT-OFF
OO	ON-ORBIT
DO	DE-ORBIT
LS	LANDING/SAFING

VEHICLE/PAYLOAD/KIT EFFECTIVITY:

102	COLUMBIA
103	DISCOVERY
104	ATLANTIS
105	ENDEAVOUR

CAUSE:
PIECE-PART FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

CRITICALITY 1R2 DURING INTACT ABORT ONLY (AVIONICS ONLY)? NO

REDUNDANCY SCREEN

A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

METHOD OF FAULT DETECTION:

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VISUAL

MASTER MEAS. LIST NUMBERS: NONE

CORRECTING ACTION: MANUAL

CORRECTING ACTION DESCRIPTION:
CREW CAN CONFIGURE MDU TO DISPLAY INFORMATION PROVIDED BY THE REDUNDANT ADC.

REMARKS/RECOMMENDATIONS:
NONE

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF ONE ADC PAIR

(B) INTERFACING SUBSYSTEM(S):
LOSS OF ONE ADC PAIR

(C) MISSION:
NO EFFECT FIRST FAILURE

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE AS THE RESULT OF INABILITY TO RESPOND TO SYSTEM FAILURES:

CASE 1:
FIRST FAILURE - LOSS OF FIRST CIRCUIT BREAKER
SECOND FAILURE - LOSS OF REDUNDANT CIRCUIT BREAKER
THIRD FAILURE - LOSS OF CAUTION & WARNING ALARM
FOURTH FAILURE - LH2 TOPPING VALVE (PV13) FAILS TO REMAIN OPEN
FIFTH FAILURE - LH2 MANIFOLD RELIEF SYSTEM FAILS TO RELIEVE

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CREW USES LH2/LO2 MANIFOLD PRESSURE PARAMETER TO DETERMINE WHICH PROPELLANT MANIFOLD REQUIRES IMMEDIATE VACUUM INERTING. PRESSURE BUILDUP DUE TO RELIEF SYSTEM FAILURE WILL CAUSE MANIFOLD RUPTURE RESULTING IN LEAKAGE OF PROPELLANT INTO AFT COMPARTMENT. POSSIBLE AFT COMPARTMENT OVERPRESSURIZATION AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF CRITICAL ADJACENT COMPONENTS DUE TO CRYOGENIC EXPOSURE.

CASE 2:
FIRST FAILURE - LOSS OF FIRST CIRCUIT BREAKER
SECOND FAILURE - LOSS OF REDUNDANT CIRCUIT BREAKER
THIRD FAILURE - LOSS OF CAUTION & WARNING ALARM
FOURTH FAILURE - MPS HELIUM LEAK (CREW IS UNAWARE OF THE SITUATION AND ALLOWS PRESSURE IN THE SEAL DROPS BELOW REDLINE RESULTED IN SSME SHUTDOWN)
FIFTH FAILURE - LOSS OF SECOND SSME

FAILURES WILL RESULT IN A CONTINGENCY (NON-INTACT) ABORT UNLESS SINGLE ENGINE PRESS-TO-MECO OR TAL CAPABILITY EXISTS).

- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: MINUTES

TIME FROM FAILURE OCCURRENCE TO DETECTION: IMMEDIATE

TIME FROM DETECTION TO COMPLETED CORRECTING ACTION: SECONDS

IS TIME REQUIRED TO IMPLEMENT CORRECTING ACTION LESS THAN TIME TO EFFECT?
YES

RATIONALE FOR TIME TO CORRECTING ACTION VS TIME TO EFFECT:
N/A (CORRECTIVE ACTION CAN BE COMPLETED BEFORE CRITICAL EFFECT)

HAZARD REPORT NUMBER(S):

HAZARD(S) DESCRIPTION:

- APPROVALS -

SS&PAE ENGR	: N. D. NGUYEN	:
MEDS SYSTEM	: M. B. WARNER	:
MEDS HARDWARE	: R. M. SITAPARA	: 4/28/95