FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE
NUMBER: 05-6-2228 -X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
REVISION: 1 07/26/99

PART DATA

	PART NAME **VENDOR NAME**	**PART NUMBER** **VENDOR NUMBER**
LRU	: PANEL R1A1	V070-730275
SRU	: SWITCH, TOGGLE	ME452-0102-7101

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
SWITCH, TOGGLE, SPDT - PAYLOAD AFT POWER MAIN B AND MAIN C

REFERENCE DESIGNATORS: 32V73A1A1S30
32V73A1A1S31

QUANTITY OF LIKE ITEMS: 2
TWO, ONE/MN DC BUS A AND B, PNL R1A1

FUNCTION:
PROVIDES ON/OFF MANUAL CONTROL TO A POWER CONTROLLER FOR CONNECTING MAIN DC BUS B OR C TO THE AFT PAYLOAD BUS B OR C.

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SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
LRU: PANEL R1A1 **CRITICALITY OF THIS**
ITEM NAME: SWITCH, TOGGLE **FAILURE MODE:** 1R3

FAILURE MODE:
SHORT TO CASE (GROUND)

MISSION PHASE:
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 STRUCTURAL FAILURE, MECHANICAL SHOCK, VIBRATION, CONTAMINATION, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN
A) PASS
B) N/A
C) PASS

PASS/FAIL RATIONALE:
A)

B)
"B" SCREEN IS "N/A" BECAUSE SWITCH IS NOT NORMALLY OPERATED DURING FLIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
SHORT TO GROUND CAUSES ASSOCIATED CIRCUIT BREAKERS TO OPEN RESULTING IN LOSS OF THE FOLLOWING SWITCHING FUNCTIONS: FUEL CELL 2 (3) TO/FROM MAIN DC BUS B (C); MAIN DC BUS B (C) TO/FROM TIE BUS; MAIN DC BUS B (C) TO/FROM PRIMARY

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PAYLOAD BUS; AND FUEL CELL 3 TO/FROM PRIMARY PAYLOAD BUS. RESULTS IN LOSS OF REDUNDANCY (ABILITY TO REMOVE LOAD) FOR FUEL CELL SAFING.

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

(C) MISSION:
NO EFFECT - FIRST FAILURE

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
SECOND FAILURE - LOSS OF REDUNDANT REACTANT VALVE CLOSURE CAPABILITY. AFTER THIRD FAILURE (LOSS OF ASSOCIATED ESSENTIAL BUS), POSSIBLE LOSS OF CREW/VEHICLE DUE TO INABILITY TO SAFE A FUEL CELL. LOSS OF THE ASSOCIATED ESSENTIAL BUS RESULTS IN LOSS OF THE AFFECTED FUEL CELL'S COOLANT PUMP AS WELL AS REDUNDANT CONTROL OF ITS REACTANT VALVES. THIS NECESSITATES REMOVAL OF ALL LOADS FROM THE FUEL CELL IN ORDER TO RENDER IT SAFE. INABILITY TO REMOVE THE BUS LOAD FROM THE FUEL CELL UNDER THESE CIRCUMSTANCES WILL RESULT IN FUEL CELL OVERHEATING WITH SUBSEQUENT RUPTURE AND/OR EXPLOSION/FIRE.

- APPROVALS -

EDITORIALLY APPROVED	: BNA	: J. Kimura 7-26-99
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-025_05-6