PRINT DATE: 07/26/99

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE
NUMBER: 05-6-2226 -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	ME452-0102-7105

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
SWITCH, TOGGLE, SPDT - PAYLOAD PRIMARY POWER, FUEL CELL NO. 3

REFERENCE DESIGNATORS: 32V73A1A1S27

QUANTITY OF LIKE ITEMS: 1
ONE, PILOT RH CONSOLE

FUNCTION:
PROVIDES MANUAL CONTROL TO MOTOR SWITCH USED TO CONNECT FUEL CELL NO. 3 TO OR DISCONNECT FUEL CELL NO. 3 FROM THE PRIMARY PAYLOAD BUS. THE SWITCH CONNECTS ESSENTIAL BUS 3AB OR MAIN DC BUS A FOR CLOSING (ON) OR OPENING (OFF) THE MOTOR SWITCH POWER CONTACTS.

FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE
NUMBER: 05-6-2226-02

REVISION#: 1 07/26/99

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

FAILURE MODE:
FAILS CLOSED TO "ON" POSITION

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:
CONTAMINATION, PIECE PART STRUCTURAL FAILURE, MECHANICAL SHOCK, VIBRATION, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN
A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
INADVERTENT CLOSURE OF FUEL CELL 3 TO PAYLOAD PRIMARY POWER MOTOR SWITCH WITH INABILITY TO REMOVE PAYLOAD PRIMARY POWER FROM FUEL CELL 3.

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL FAILURE MODE
NUMBER: 05-6-2226- 02

RESULTS IN LOSS OF REDUNDANCY (ABILITY TO REMOVE LOAD) FOR FUEL CELL 3 SAFING.

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

(C) MISSION:
FIRST FAILURE - NO EFFECT

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
SECOND FAILURE - LOSS OF REDUNDANT REACTANT VALVE CLOSURE CAPABILITY.
THIRD FAILURE (LOSS OF ESSENTIAL BUS 3AB) - POSSIBLE LOSS OF CREW/VEHICLE DUE TO INABILITY TO "SAFE" FUEL CELL 3. LOSS OF ESSENTIAL BUS 3AB RESULTS IN LOSS OF FUEL CELL 3 COOLANT PUMP AS WELL AS REDUNDANT CONTROL OF ITS REACTANT VALVES. THIS NECESSITATES REMOVAL OF ALL LOAD 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. Komura 7-26-99
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-025_05-6