FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE
NUMBER:05-6Q-2112 -X

SUBSYSTEM NAME: EPD&C - DISPLAYS & CONTROLS
REVISION: 1 12/18/95

PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:PANEL O13	V070-730393
SRU	:CIRCUIT BREAKER	MC454-0026-2050

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
CIRCUIT BREAKER

REFERENCE DESIGNATORS: 33V73A1CB1
33V73A1CB9

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:
PROVIDES CIRCUIT OVERLOAD PROTECTION FOR ESSENTIAL BUSSES 1BC AND 2CA. POWER TO MASTER ALARM LIGHTS VIA RELAY AND/OR TOGGLE SWITCH AND TO C&W ANNUNCIATOR CIRCUITRY AND ELECTRONICS UNIT.

FAILURE MODES EFFECTS ANALYSIS FMEA – NON-CIL FAILURE MODE
NUMBER: 05-6Q-2112-01

REVISION#: 1 12/18/95

SUBSYSTEM NAME: EPD&C - DISPLAYS & CONTROLS
LRU: PANEL O13
ITEM NAME: CIRCUIT BREAKER

CRITICALITY OF THIS FAILURE MODE: 1R3

FAILURE MODE:
LOSS OF OUTPUT. FAILS OPEN. INADVERTENTLY OPENS.

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 STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL AND/OR THERMAL STRESS AND VIBRATION.

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN
A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

CORRECTING ACTION: MANUAL

CORRECTING ACTION DESCRIPTION:
THE CREW MUST CONTINUALLY MONITOR FAULT SUMMARY MESSAGES ON THE DISPLAY UNIT (CRT) FOR LOSS OF THE ASSOCIATED ESSENTIAL BUS UNTIL POWER IS

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RESTORED TO THE AFFECTED POWER SUPPLY THROUGH AN IFM PROCEDURE, THE REMAINING POWER SUPPLY IS REDUNDANTLY POWERED THROUGH AN IFM PROCEDURE OR THE ASSOCIATED FUEL CELL IS PLACED IN STANDBY.

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF CAPABILITY TO CONDUCT POWER.

(B) INTERFACING SUBSYSTEM(S):
LOSS OF POWER TO CAUTION AND WARNING A OR C&W B.

(C) MISSION:
NO EFFECT.

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
EACH POWER SUPPLY IS CONNECTED TO A DIFFERENT ESSENTIAL BUS THROUGH C&W CIRCUIT BREAKERS. LOSS OF ONE CWE POWER SUPPLY WILL TRIGGER A C&W ALARM. THE CREW ACKNOWLEDGES THE ALARM BY DEPRESSING THE MASTER ALARM RESET SWITCH. IF THE REMAINING POWER SUPPLY, OR ITS ESSENTIAL BUS FAILS, THE RESULT WILL BE THE LOSS OF ALL C&W AURAL AND VISUAL ALARMS. THE ESSENTIAL BUS FAILURE WILL SIMULTANEOUSLY INTERRUPT FUEL CELL COOLANT PUMP OPERATION, CREATING A TIME CRITICAL EMERGENCY CONDITION. THE CREW MUST TAKE REMEDIAL ACTION WITHIN 9 MINUTES OF ESSENTIAL BUS FAILURE TO AVOID A CATASTROPHIC FUEL CELL FAILURE.

DESIGN CRITICALITY (PRIOR TO DOWNGRADE, DESCRIBED IN (F)): 1R2

(F) RATIONALE FOR CRITICALITY DOWNGRADE:
AFTER THE FIRST FAILURE THE CREW WILL PERFORM AN IFM TO RESTORE POWER TO THE AFFECTED C&W OR TO REDUNDANTLY POWER THE REMAINING C&W UNIT AND PRECLUDE A SINGLE FAILURE (ESSENTIAL BUS LOSS) FROM RESULTING IN AN UNANNUNCIATED TIME CRITICAL CATASTROPHIC FUEL CELL FAILURE.

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- APPROVALS -

EDITORIALLY APPROVED	: RI	: 12/19/95
EDITORIALLY APPROVED	: JSC	: 1-2-96
TECHNICAL APPROVAL	: APPROVAL FORM	: 95-CIL-003-RI