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PRINT DATE: 06/01/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) - NONCRITICAL HARDWARE
NUMBER: 05-6WA-2179HA -X

SUBSYSTEM NAME: EPD&C - WATER SPRAY BOILER

REVISION: 05/25/95

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: AFT PCA 4, 5, AND 6	VO70-785280
SRU	: REMOTE POWER CONTROLLER	MC450-0017-S200
SRU	: REMOTE POWER CONTROLLER	MC450-0017-2200
SRU	: REMOTE POWER CONTROLLER	MC450-0017-1200

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

THE REMOTE POWER CONTROLLER HAS A 20 AMP CURRENT RATING WITH TWO IN SERIES FOR EACH WSB CONTROLLER "A" AND WSB WATER INLET LINE HEATER POWER CIRCUIT.

REFERENCE DESIGNATORS: 54V76A134RPC21
54V76A134RPC22
55V76A135RPC21
55V76A135RPC22
56V76A138RPC21
56V76A138RPC22

QUANTITY OF LIKE ITEMS: 6
SIX - TWO FOR EACH WSB CONTROLLER "A"

FUNCTION:

THE REMOTE POWER CONTROLLER (RPC) POWERS THE ASSOCIATED WATER SPRAY BOILER (WSB) CONTROLLER "A", AND WSB INLET LINE HEATER. CONTROLLER "A" FOR EACH WSB IS POWERED FROM A DIFFERENT MAIN BUS.

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NONCRITICAL FAILURE MODE

NUMBER: 05-6WA-2179HA- 01

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SUBSYSTEM NAME: EPD&C- WATER SPRAY BOILER

LRU: AFT PCA-4, 5, 6

CRITICALITY OF THIS

ITEM NAME: REMOTE POWER CONTROLLER

FAILURE MODE: 1R3

FAILURE MODE:

LOSS OF OUTPUT, FAILS TO CONDUCT, FAILS TO TURN ON

MISSION PHASE:

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

VEHICLE/PAYLOAD/KIT EFFECTIVITY:

102	COLUMBIA
103	DISCOVERY
104	ATLANTIS
105	ENDEAVOUR

EFFECTIVE FOR WSB INLET LINE ELECTRICAL
HEATER MOD ONLY

CAUSE:

PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY & SCREEN

- A) PASS
- B) PASS
- C) PASS

PASS/FAIL RATIONALE:

- A)
- B)
- C)

CORRECTING ACTION:

ASCENT: SHUT DOWN AFFECTED APU/HYD SYSTEM AT AN APPROPRIATE TIME BASED ON FLIGHT PHASE AND SYSTEM TEMPERATURES.
 ENTRY: SHUT DOWN AFFECTED APU/HYD SYSTEM OR DELAY APU START IF FAILURE IS KNOWN PRIOR TO DEORBIT.

THE FOLLOWING OPERATIONAL USE APPLIES TO NORMAL MISSIONS (NO FAILURES):
SWITCH TO "B" SIDE 24 HOURS AFTER ORBITAL INSERTION.

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**FAILURE MODES EFFECTS ANALYSIS (FMEA) - NONCRITICAL FAILURE MODE
NUMBER: 05-6WA-2179HA-01**

REMARKS/RECOMMENDATIONS:

THIS FAILURE MODE WAS NOT ASSESSED FOR CRITICALITY 1R2 DURING INTACT ABORT ONLY (AVIONICS ONLY) SINCE REDUNDANCY REQUIREMENTS HAVE BEEN MAINTAINED PER NSTS 22206, PARAGRAPH 3.2.C.2.

- FAILURE EFFECTS -

(A) SUBSYSTEM:

LOSS OF POWER TO CONTROLLER "A" AND INLET WATER LINE HEATER OF ASSOCIATED WATER SPRAY BOILER.

(B) INTERFACING SUBSYSTEM(S):

LOSS OF LINE HEATER WILL CAUSE WSB SPRAY BAR FREEZE UP AND SUBSEQUENT LOSS OF COOLING CAPABILITY, RESULTING IN LOSS OR LIMITED RUN TIME OF ONE APU/HYD SYSTEM. LIMITED RUN TIME MAY NOT ALLOW AFFECTED APU/HYD SYSTEM TO SUPPORT AN ABORT SCENARIO OR HOT APU RESTART FOR IMMEDIATE RETURN.

(C) MISSION:

NO EFFECT - FIRST FAILURE. WSB SPRAY BAR FREEZE-UP SUBLIMATES IN 3 HOURS MAX.

(D) CREW, VEHICLE, AND ELEMENT(S):

NO EFFECT - FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:

FUNCTIONAL CRITICALITY EFFECTS FOR LOSS OF RPC OUTPUT: LOSS OF CONTROLLER "A", AND LINE HEATER. SECOND FAILURE: LOSS OF REDUNDANT CONTROLLER "B" IN SAME WSB WILL CAUSE LOSS OF WSB. THIRD FAILURE: LOSS OF CREW/VEHICLE WITH LOSS OF SECOND APU/HYD SYSTEM.

FUNCTIONAL CRITICALITY EFFECTS FOR LOSS OF HEATER: CRITICALITY 1R2 FOR RTLS, TAL, AOA ABORTS, AND IMMEDIATE RETURN (HOT APU RESTART); LOSS OF WSB DUE TO FREEZING OF SPRAY BAR WILL CAUSE LOSS OF ONE APU/HYD SYSTEM. LOSS OF A SECOND APU/HYD SYSTEM WILL RESULT IN LOSS OF CREW/VEHICLE.

- APPROVALS -

PRODUCT ASSURANCE ENGR : T. K. KIMURA
DESIGN ENGINEERING : G. J. SCHWARTZ

J. Kammer 6/1/95
G. J. Schwartz 6-1-95