 PRINT DATE: 06/01/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NONCRITICAL HARDWARE
NUMBER: 05-6WA-2259HA-X

SUBSYSTEM NAME: EPD&C-WATER SPRAY BOILER
REVISION: 1 07/26/94

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU :	AFT PCA - 4, 5, 6	VO70-765280
SRU :	DIODE	JANTXV1N4246

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, SWITCH ISOLATION, 1 AMP, WSB CONTROLLER "A" LOGIC CIRCUIT

REFERENCE DESIGNATORS: 54V76A134A1CR6
54V76A134A1CR8
55V76A135A1CR6
55V76A135A1CR8
56V76A136A1CR6
56V76A136A1CR8

QUANTITY OF LIKE ITEMS: 6
SIX, TWO PER SYSTEM

FUNCTION:
CONDUCTS LOGIC INPUTS TO WSB CONTROLLER "A", PROVIDES POWER TRANSFER AND CIRCUIT ISOLATION BETWEEN VEHICLE COMMANDS, CONTROLLING RPC'S IN AFT PCA'S 5, 6 AND 4 FOR WSB'S 1, 2 AND 3.

NOTE: CONTROLLER "A" CIRCUIT PROVIDES POWER TO WSB WATER INLET LINE HEATER.

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NONCRITICAL FAILURE MODE
NUMBER: 06-6WA-2269HA- 01

REVISION# 05/25/95

SUBSYSTEM NAME: EPD&C-WATER SPRAY BOILER
LRU: AFT PCA - 4, 5, 6
ITEM NAME: DIODE

CRITICALITY OF THIS FAILURE MODE: 1R3

FAILURE MODE:
OPEN, FAILS TO CONDUCT

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
EFFECTIVE FOR WSB INLET LINE ELECTRICAL HEATER MOD ONLY

CAUSE:
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), ELECTRICAL STRESS, THERMAL STRESS; PROCESSING ANOMALY

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-2259HA-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 OPEN DIODE: LOSS OF CONTROLLER "A", AND LOSS OF LINE HEATER. SECOND FAILURE: LOSS OF REDUNDANT CONTROLLER "B" IN SAME WSB WILL CAUSE LOSS OF WSB. THIRD FAILURE: LOSS OF SECOND APU/HYD SYSTEM WILL CAUSE LOSS OF CREW/VEHICLE.

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 : T. Kimura 6/1/95
DESIGN ENGINEERING : G. J. SCHWARTZ : [signature] 6-1-95