PRINT DATE: 05/17/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NONCRITICAL HARDWARE
NUMBER: 05-6J-2272-X

SUBSYSTEM NAME: EPD&C MAIN PROPULSION SYSTEM
REVISION: 05/11/95

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:	AFT LCA 1	MC450-0057-0001
SRU	:	DIODE	JANTXV1N5551

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, BLOCKING (3 AMP) - LH2 HIGH POINT BLEED VALVE, MDM OPEN COMMAND SWITCH BLOCKING.

REFERENCE DESIGNATORS: 54V76A121A60CR23
54V76A121A60CR25

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:
ISOLATES MDM OPEN COMMAND FROM MANUAL SWITCH OPEN COMMAND TO HDC FOR CONTROL OF POWER TO OPEN SOLENOID (LV78) OF GH2 HIGH POINT BLEED VALVE.

PRINT DATE: 05/11/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NONCRITICAL FAILURE MODE
NUMBER: 05-6J-2272 - 02

REVISION# **05/11/95**

SUBSYSTEM NAME: EPD&C MAIN PROPULSION SYSTEM
LRU: AFT LCA 1
ITEM NAME: DIODE

CRITICALITY OF THIS FAILURE MODE: 1R3

FAILURE MODE:
SHORT (END TO END)

MISSION PHASE:
PL PRELAUNCH

VEHICLE/PAYLOAD/KIT EFFECTIVITY:
102 COLUMBIA
103 DISCOVERY
104 ATLANTIS
105 ENDEAVOUR

CAUSE:
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, 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:
OMI S100 (LH2 SYSTEM) SEQUENCE TITLED "EMERGENCY PROCEDURE FOR MAJOR LEAK OR FIRE..." CONTAINS SAFING SEQUENCE OF EVENTS FOR MAJOR LEAKS IN THE PROPELLANT SYSTEMS.

REMARKS/RECOMMENDATIONS:
NONE

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF POWER TO OPEN SOLENOID DUE TO GROUNDING OF MDM OPEN COMMAND A OR B THROUGH THE COCKPIT SWITCH (S9).

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FAILURE MODES EFFECTS ANALYSIS (FMEA) – NONCRITICAL FAILURE MODE
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(B) INTERFACING SUBSYSTEM(S):
HIGH POINT BLEED VALVE PREMATURELY CLOSES. GH2 WILL ACCUMULATE IN LH2 17-INCH MANIFOLD PRIOR TO ENGINE START RESULTING IN A LAUNCH SCRUB.

LCC MONITORS LH2 17-INCH MANIFOLD DISCONNECT AND HIGH POINT BLEED TEMPERATURE TRANSDUCERS UP TO T-31 SECONDS TO VERIFY BY THE ABSENCE OF GH2 THAT THE HIGH POINT BLEED VALVE REMAINS OPEN. ADDITIONALLY, THE BLEED VALVE CLOSE POSITION SWITCH IS VERIFIED OFF BETWEEN START OF SLOW FILL (APPROXIMATELY T-6 HOURS) AND T-31 SECONDS (ENGINEERING REQUIREMENT).

(C) MISSION:
LAUNCH SCRUB

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
1R/3, 4 PATH SCENARIO. TIME FRAME - PRELAUNCH.

1) DIODE FAILS SHORT (END TO END) GROUNDING THE MDM OPEN COMMAND CAUSING THE HIGH POINT BLEED VALVE (PV22) TO CLOSE.
2) HIGH POINT BLEED VALVE (PV22) CLOSE INDICATION FAILS OFF.
3) LH2 17-INCH MANIFOLD DISCONNECT TEMPERATURE TRANSDUCER ERRONEOUSLY INDICATES WITHIN LCC LIMITS.
4) FACILITY HIGH POINT BLEED TEMPERATURE TRANSDUCER ERRONEOUSLY INDICATES WITHIN LCC LIMITS.

ACCUMULATED GH2 WILL BE INGESTED INTO THE ENGINES AT START, RESULTING IN POSSIBLE UNCONTAINED ENGINE DAMAGE DUE TO PUMP CAVITATION. POSSIBLE LOSS OF CREW/VEHICLE.

- APPROVALS -

PRODUCT ASSURANCE ENGR : T. K. KIMURA
DESIGN ENGINEERING : J. L. PECK

T Kimura 5/11/95
5/16/95