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PRINT DATE: 10/26/95

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE  
NUMBER: M5-6MR-0029-X**

**SUBSYSTEM NAME: ORBITER DOCKING SYSTEM**

**REVISION: 1 SEP 30, 1995**

	<b>PART NAME VENDOR NAME</b>	<b>PART NUMBER VENDOR NUMBER</b>
LRU	: DOCKING SYSTEM POWER PANEL	V82B-730150
SRU	: DIODE	JANTX1N1188R

**PART DATA**

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:  
DIODES, POWER, 35 AMP - PNL A7A3 PNL A, PNL B, AND PNL C BUSES CIRCUITS.**

**REFERENCE DESIGNATORS: 36V73A7A3CR1  
36V73A7A3CR2  
36V73A7A3CR3  
36V73A7A3CR4  
36V73A7A3CR5  
36V73A7A3CR6**

**QUANTITY OF LIKE ITEM: 6  
(SIX)**

**FUNCTION:  
THESE DIODES PROVIDE BACK SURGE PROTECTION AND DISTRIBUTION FOR THE MN  
A, MN B, AND MN C POWER BUSES FROM THE A8A3 PANEL CIRCUITS.**

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**FAILURE MODES EFFECTS ANALYSIS (FMEA) - NONCRITICAL FAILURE MODE  
NUMBER: M5-GMR-0029- 01**

REVISION# 1 SEP 30, 1995

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM  
LRU: JANTX1N1188P  
ITEM NAME: DIODE

CRITICALITY OF THIS  
FAILURE MODE: 1R3

FAILURE MODE:  
FAILS OPEN, FAILS TO CONDUCT, SHORT TO STRUCTURE

MISSION PHASE:  
OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 104 ATLANTIS

CAUSE:  
A) PIECE PART FAILURE, B) CONTAMINATION, C) VIBRATION, D) MECHANICAL SHOCK,  
E) PROCESSING ANOMALY, F) THERMAL STRESS

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

CRITICALITY 1R2 DURING INTACT ABORT ONLY (AVIONICS ONLY)? NO

REDUNDANCY SCREEN      A) PASS  
   B) N/A FAIL  
   C) PASS

PASS/FAIL RATIONALE:

A)

B)

TWO REMAINING PATHS DETECTABLE. ~~FIRST FAILURE MASKED BY REDUNDANT  
POWER SOURCE.~~

C)

METHOD OF FAULT DETECTION:  
NONE.

MASTER MEAS. LIST NUMBERS: NONE

CORRECTING ACTION:  
NONE.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - NONCRITICAL FAILURE MODE  
NUMBER: M5-6MR-0029-01**

**- FAILURE EFFECTS -**

**(A) SUBSYSTEM:**

DEGRADATION OF REDUNDANCY FOR APDS LOGIC BUS POWER SOURCE.

**(B) INTERFACING SUBSYSTEM(S):**

DEGRADED PNL BUS REDUNDANCY.

**(C) MISSION:**

NO EFFECT.

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

FIRST FAILURE - NO EFFECT.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

POSSIBLE LOSS OF CREW VEHICLE AFTER FIVE ~~THREE~~ FAILURES. 1) FIRST DIODE FAILS OPEN. NO EFFECT. 2) MPCA CONTACTOR FAILS OPEN OR SHORTS TO GROUND RESULTING IN LOSS OF APDS LOGIC REDUNDANCY. 3) ONE OF TWO MAIN LOGIC CIRCUIT BREAKERS OR DIODES IN PNL A7A3 FAILS OPEN RESULTING IN LOSS OF TWO OF THREE APDS LOGIC BUSES. ~~ALL UNDOCKING CAPABILITY~~. FAILURE OF TWO OF THREE APDS LOGIC BUSES DISABLES NOMINAL AND PYROTECHNIC SEPARATION SYSTEMS CONTROL. LOSS OF APDS PANEL CONTROL. USE IFM TO DRIVE HOOKS OPEN THROUGH A BREAKOUT BOX. 4) FAILURE OF IFM TO OPEN HOOKS. PERFORM EVA TO REMOVE 95 BOLTS HOLDING DOCKING BASE TO EXTERNAL AIRLOCK. 5) FAILURE OF EVA TO REMOVE BOLTS. LOSS OF ALL UNDOCKING CAPABILITY.

**- TIME FRAME -**

TIME FROM FAILURE TO CRITICAL EFFECT: DAYS

TIME FROM FAILURE OCCURRENCE TO DETECTION: MINUTES

TIME FROM DETECTION TO COMPLETED CORRECTIVE ACTION: N/A

TIME REQUIRED TO IMPLEMENT CORRECTIVE ACTION LESS THAN TIME TO EFFECT?  
N/A

HAZARDS: DM20HA04(F)

INABILITY TO SAFELY SEPARATE ORBITER FROM DOCKING MODULE OR MIR.

**- APPROVALS -**

PRODUCT ASSURANCE ENGINEERING  
DESIGN ENGINEERING

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J. NGUYEN

*R. Blackwell*  
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