FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE
NUMBER: 05-6J-2056A -X

SUBSYSTEM NAME: EPD&C - MAIN PROPULSION SYSTEM
REVISION: 1 08/03/00

PART DATA

	PART NAME **VENDOR NAME**	**PART NUMBER** **VENDOR NUMBER**
LRU	: AFT LCA 2	MC450-0058-0001
SRU	: DIODE	JANTXV1N5551

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, BLOCKING (3 AMP) - LH2 OUTBOARD FILL/DRAIN VALVE, MANUAL SWITCH OPEN COMMAND/GROUND OPEN COMMAND.

REFERENCE DESIGNATORS: 55V76A122CRJ3(61)

QUANTITY OF LIKE ITEMS: 1

FUNCTION:
ISOLATES THE MDM OPEN COMMAND FROM THE MANUAL SWITCH OPEN POSITION. CONDUCTS MANUAL SWITCH OPEN COMMAND AND GROUND OPEN COMMAND TO THE HDC FOR CONTROL OF POWER TO OPEN SOLENOID OF LH2 OUTBOARD FILL/DRAIN VALVE.

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: 05-6J-2056A-01

REVISION#: 1 08/16/00

SUBSYSTEM NAME: EPD&C - MAIN PROPULSION SYSTEM
LRU: AFT LCA-2 **CRITICALITY OF THIS**
ITEM NAME: LH2 O/B F/D VLV OPEN CMD BLK DIODE (PV11) **FAILURE MODE:** 1R3

FAILURE MODE:
OPEN, FAILS OPEN, FAILS TO CONDUCT

MISSION PHASE: LO LIFT-OFF

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

CAUSE:
PIECE PART STRUCTURAL FAILURE, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN
A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:
A)

B)
DIODE FAILS BE SCREEN SINCE MDM OPEN COMMAND AND GROUND OPEN COMMAND ARE LOAD SHARING AND CANNOT BE DISTINGUISHED.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
NO EFFECT FIRST FAILURE. REDUDANT MDM OPEN COMMAND WILL MAINTAIN OPEN SOLENOID POWER.

(B) INTERFACING SUBSYSTEM(S):
SAME AS A.

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(C) MISSION:
SAME AS A.

(D) CREW, VEHICLE, AND ELEMENT(S):
SAME AS A.

(E) FUNCTIONAL CRITICALITY EFFECTS:
1R/3 3 SUCCESS PATHS. TIME FRAME – ASCENT.
1) DIODE FAILS OPEN.
2) LOSS OF OPEN MDM COMMAND RESULTING IN OPEN SOLENOID (LV32) DEACTUATION. BISTABLE FEATURE MAINTAINS FILL/DRAIN VALVE IN OPEN POSITION.
3) PREMATURE ACTUATION OF CLOSE SOLENOID (LV33) RESULTING IN PREMATURE CLOSURE OF LH2 OUTBOARD FILL/DRAIN VALVE.

RESULTS IN TERMINATION OF PROPELLANT LOADING OR DETANKING WHICH MAY CAUSE A PRESSURE SPIKE AND POSSIBLE RUPTURE OF ORBITER FILL LINE, FEED LINE AND/OR GSE INTERFACE/FACILITY LINES. POSSIBLE AFT COMPARTMENT OVERPRESSURIZATION AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF ADJACENT CRITICAL FUNCTIONS DUE TO CRYO EXPOSURE.

REF. CIL 03-1-0302-06.

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX F, ITEM NUMBER 4 - DIODE.

(B) TEST:
REFER TO APPENDIX F, ITEM NUMBER 4 - DIODE.

GROUND TURNAROUND TEST
ANY TURNAROUND CHECKOUT IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:
REFER TO APPENDIX F, ITEM NUMBER 4 - DIODE.

(D) FAILURE HISTORY:
REFER TO APPENDIX F, ITEM NUMBER 4 - DIODE.

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CURRENT DATA ON TEST FAILURE, FLIGHT FAILURE, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACA DATABASE.

(E) OPERATIONAL USE:
NO CREW ACTION CAN BE TAKEN.

- APPROVALS -

S&R ENGINEERING	: W. P. MUSTY	:/S/ W.P. MUSTY
S&R ENGINEERING ITM	: P. A. STENGER-NGUYEN	:/S/ P.A. STENGER-NGUYEN
DESIGN ENGINEERING	: ANDY RIZVI	:/S/ ANDY RIZVI
MPS SYBSYSTEM MGR.	: TIM REITH	:/S/ TIM REITH
EPD&C SUBSYSTEM MGR.	: R. L. PHAN	:/S/ RICHARD PHAN
MOD	: WILLIAM LANE	:/S/ WILLIAM LANE
USA SAM	: MICHAEL SNYDER	:/S/ MICHAEL SNYDER
USA ORBITER ELEMENT	: SUZANNE LITTLE	:/S/ SUZANNE LITTLE
NASA SR&QA	: BILL PRINCE	:/S/ BILL PRINCE