 PRINT DATE 02/24/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CRITICAL HARDWARE
NUMBER: 05-6J-2040 -X

SUBSYSTEM NAME: EPD&C MAIN PROPULSION SYSTEM
REVISION: 1 02/06/95

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:	MID PCA 1	V070-764400
LRU	:	MID PCA 3	V070-764450
SRU	:	CONTROLLER, REMOTE POWER	MC450-0017-1030
SRU	:	CONTROLLER, REMOTE POWER	MC450-0017-2030
SRU	:	CONTROLLER, REMOTE POWER	MC450-0017-3030
SRU	:	CONTROLLER, REMOTE POWER	MC450-0017-4030

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
CONTROLLER, REMOTE POWER (RPC), 3 AMP, LO2 RELIEF SHUTOFF VALVE CLOSE SOLENOID (LV24).

REFERENCE DESIGNATORS: 40V76A25RPC28
40V76A27RPC32

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:
CONDUCTS MAIN BUS POWER TO CLOSE SOLENOID OF LO2 RELIEF SHUTOFF VALVE RPC IS IN SERIES WITH DIODE AND HDC.

- APPROVALS -

PRODUCT ASSURANCE MGR	: K. L. PRESTON	K. L. Preston 4/21/95
PRODUCT ASSURANCE ENGR	: N. HAFEZIZADEH	N. Hafezizadeh
DESIGN ENGINEERING	: J. PECK	
NASA EPD&C SUBSYS MGR	:	5/11/95
NASA MPS SUBSYS MGR	:	N/A
NASA EPD&C SSMA	:	3-17-96
NASA MPS SSMA	:	N/A

U.S. Gov't

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM [illegible] - MAIN PROP. FMEA NO 05-6J -2040 -2 REV:04/26/88

ASSEMBLY [illegible] PCA-1, 3
P/N RI MC450-0017-1030/2030
P/N VENDOR:
QUANTITY :2
:TWO
:

CRIT. FUNC: 1R
CRIT. HDW: 2

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL LO X OO DO LS

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS

PREPARED BY:
DES J BROWN
REL F DEFENSOR
QE for D MASAI

APPROVED BY:
DES
REL
QE

APPROVED BY (NASA):
EPDC SSM
MPS SSM
EPDC REL
MPS REL
QE

ITEM:
CONTROLLER, REMOTE POWER (RPC), 3 AMP, LO2 RELIEF SHUTOFF VALVE CLOSE SOLENOID (LV24).

FUNCTION:
CONDUCTS MAIN BUS POWER TO CLOSE SOLENOID OF LO2 RELIEF SHUTOFF VALVE. RPC IS IN SERIES WITH DIODE AND HDC. 40V76A25RPC28, 40V76A27RPC32.

FAILURE MODE:
INADVERTENT OUTPUT, FAILS "ON", FAILS TO TURN "OFF".

CAUSE(S):
PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS.

EFFECT(S) ON:
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE (E)FUNCTIONAL CRITICALITY

(A) DEGRADATION OF REDUNDANCY AGAINST PREMATURE ACTUATION OF CLOSE SOLENOID.

(B) NO EFFECT - FIRST FAILURE. SERIES HDC PREVENTS INADVERTENT POWER TO LO2 RELIEF SHUTOFF VALVE CLOSE SOLENOID.

(C,D) NO EFFECT - FIRST FAILURE.

(E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE. TIME FRAME - ASCENT.
1) RPC FAILS "ON".
2) SERIES HDC FAILS "ON" CAUSING LOSS OF CAPABILITY TO OPEN LO2 RELIEF SHUTOFF VALVE (PV7).

RESULTS IN LACK OF RELIEF CAPABILITY PRIOR TO DUMP. POSSIBLE RUPTURE OF THE LO2 MANIFOLD CAUSING LO2 LEAKAGE INTO AFT COMPARTMENT, OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF ADJACENT CRITICAL COMPONENTS DUE TO CRYOGENIC EXPOSURE.

A VENT PATH EXISTS (APPROXIMATELY 4 SCFM PER BLEED CHECK VALVE) THROUGH THE POGO SYSTEM TO THE SSME HPOT SEAL AND RELEASED OVERBOARD. THIS VENT PATH IS NOT CONSIDERED SUFFICIENT TO RELIEVE THE LO2 MANIFOLD IF THE MANIFOLD RELIEF SYSTEM FAILS. POSSIBLE LOSS OF CREW/VEHICLE.

DISPOSITION & RATIONALE:
(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) DISPOSITION AND RATIONALE:
REFER TO APPENDIX B, ITEM NO. 2 - REMOTE POWER CONTROLLER.

(B) GROUND TURNAROUND TEST
COMPLETE ELECTRICAL VERIFICATION V41AB0.070 "O" EVERY FLIGHT.

(E) OPERATIONAL USE
LO2 MANIFOLD PRESSURE IS ON CAUTION AND WARNING.
POST MECO/PRI DUMP: START MPS PROPELLANT DUMP AS SOON AS POSSIBLE.
POST DUMP: OPEN THE LO2 FILL/DRAIN VALVES.