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PRINT DATE: 09/09/92

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: M5-6MB-2214-G-X

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC
REVISION : 9 09/09/92

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: MID PCA 1	V070-764400
LRU	: MID PCA 2	V070-764430
SRU	: CONTROLLER, HYBRID DRIVER	MC477-0263-0002

- PART DATA -

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
CONTROLLER, HYBRID DRIVER (HDC), TYPE III - ECLSS O2 SYSTEM NO. 1 AND NO.
SUPPLY VALVE CIRCUITS - CLOSE POSITION

REFERENCE DESIGNATORS: 40V76A25AR33
 : 40V76A25AR34
 : 40V76A26AR33
 : 40V76A26AR34

QUANTITY OF LIKE ITEMS: 4
FOUR, TWO PER O2 SUPPLY VALVE CIRCUIT

FUNCTION:
CONTROLS POWER TO CLOSE O2 SYSTEM NO. 1 AND NO. 2 SUPPLY VALVES. CONTR
CIRCUITRY IS INDEPENDENT FOR EACH SUPPLY VALVE.

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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
 NUMBER: M5-6MB-2214-G-02

SUBSYSTEM: ELECTRICAL POWER GENERATION - CRYO, GENERIC
 LRU MID PCA 1
 ITEM NAME: CONTROLLER, HYBRID DRIVER

REVISION# 9 09/09/92
 CRITICALITY OF THIS
 FAILURE MODE: 1R2

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

PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING
 ANOMALY, THERMAL STRESS

MISSION PHASE:
 LO LIFT-OFF
 OO ON-ORBIT
 DO DE-ORBIT
 LS LANDING SAFING

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

USE:
 PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING
 ANOMALY, THERMAL STRESS

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

PASS/FAIL RATIONALE:

A)

B)

"B" SCREEN IS N/A BECAUSE OF STANDBY REDUNDANCY WHERE THE ECLSS O2 SUPPLY
 VALVES ARE NORMALLY NOT CLOSED DURING A FLIGHT.

C)

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: M5-6MB-2214-G-02

- FAILURE EFFECTS -

(A) SUBSYSTEM:

LOSS OF CONTROL OF ONE OF TWO SERIES HDC'S IN THE O2 SUPPLY VALVE "CLOSED" CIRCUIT.

(B) INTERFACING SUBSYSTEM(S):

SAME AS (A)

(C) MISSION:

NO EFFECT - FIRST FAILURE

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

NO EFFECT - FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE FOLLOWING SCENARIO: 1) FIRST HDC FAILS "ON" - NO EFFECT, 2) SECOND SERIES HDC FAILS "ON" - AFFECTED ECLC VALVE FAILS "CLOSED". THIS WILL RESULT IN INSUFFICIENT OXYGEN FLOW FOR THE ASTRONAUTS LAUNCH/ENTRY SUITS (LES). LOSS OF THIS EMERGENCY SYSTEM (LES) MAY OCCUR IN A CABIN ENVIRONMENT WHERE HARMFUL CONTAMINANTS OR DEPRESSURIZATION MAY EXIST.

- DISPOSITION RATIONALE -

(A) DESIGN:

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER

(B) TEST:

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER

GROUND TURNAROUND TEST

CIRCUIT IS FUNCTIONALLY VERIFIED DURING DRIVER SERIES REDUNDANCY TEST (ECLC O2 SUPPLY VALVE TEST) DURING EVERY TURNAROUND.

(C) INSPECTION:

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER

(D) FAILURE HISTORY:

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER

(E) OPERATIONAL USE:

NO CREW ACTION AFTER FIRST FAILURE.

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- APPROVALS -

PRODUCT ASSURANCE MGR	:	T. J. EAVENSON	:	<u>J. J. Lawrence</u> 9/18/92
PRODUCT ASSURANCE ENG	:	T. K. KIMURA	:	<u>J. R. Kammuse</u> 9/14/92
DESIGN ENG TEAM LEADER	:	G. M. ANDERSON	:	<u>G. M. Anderson</u> 9/15/92
DESIGN ENGINEERING	:	T. D. NGUYEN	:	<u>T. D. Nguyen</u> 9/15/92
NASA RELIABILITY	:		:	<u>W. G. ...</u> 12/16/92
NASA SUBSYSTEM MANAGER	:		:	<u>Robert J. ...</u> 12/16/92
NASA EPD&C RELIABILITY	:		:	<u>David ... For S. Woodard</u> 1-14/92
NASA QUALITY ASSURANCE	:		:	<u>W. R. ...</u>
NASA EPD&C SUBSYS MGR	:		:	<u>Thomas ... to E. Alavi</u> 1/14/92