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PRINT DATE: 04/13/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE
 NUMBER: 05-61A-2179 -X

SUBSYSTEM NAME: EPD&C - REMOTE MANIP. ARM

REVISION: 3 02/06/95

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: MID PCA 2	VC70-764430
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-1100
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-2100
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-3100
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-4100

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
 CONTROLLER, REMOTE POWER RPC 10 AMP, MAIN BUS B, STARBOARD AND PORT
 BACKUP

REFERENCE DESIGNATORS: 40V76A26RPC30
 40V76A26RPC31

QUANTITY OF LIKE ITEMS: 2
 TWO

FUNCTION:
 FOLLOWING A CREW INITIATED ARM SELECTION COMMAND, THE RPC CONDUCTS
 ASSOCIATED 28 VDC MAIN BUS B TO THE RELATED STARBOARD AND PORT REMOTE
 MANIPULATOR ARM. THE RPC DESIGN INCORPORATES OVERCURRENT TRIP
 PROTECTION PLUS TIMED CURRENT LIMITING FOR TRANSIENT CONDITIONS. RESET IS
 ACCOMPLISHED THROUGH CONTROL SIGNAL REMOVAL AND REAPPLICATION.

- APPROVALS -

PAE MANAGER : K. L. PRESTON
 PRODUCT ASSURANCE ENGR : N. HAFEZIZADEH
 DESIGN ENGINEERING : D. SOVEREIGN
 NASA EPD&C SUBSYS MGR :
 NASA SUBSYS MGR :
 NASA EPD&C SSMA :
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 N/A
John B. ... 3-16-95
 N/A

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SUBSYSTEM: EPD&C - REMOTE MANIP. ARM
 LRU :MID PCA 2
 ITEM NAME: CONTROLLER, REMOTE POWER

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CRITICALITY OF THIS
 FAILURE MODE:1R2

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

MISSION PHASE:
 00 ON-ORBIT

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

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

CRITICALITY I/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
 B) FAIL
 C) PASS

PASS/FAIL RATIONALE:

- A)
- B)
 IN FLIGHT - LACK TELEMETRY TO DETECT FAILURE.
- C)

- FAILURE EFFECTS -

- (A) SUBSYSTEM:
 FAILURE WILL RESULT IN CONTINUOUS PRESENCE OF BACKUP DC POWER TO THE
 AFFECTED (STARBOARD OR PORT) RMS.
- (B) INTERFACING SUBSYSTEM(S):
 FAILURE DURING NORMAL RMS OPERATIONS WILL RESULT IN SIMULTANEOUS
 ROUTING OF PRIMARY AND BACKUP POWER TO THE SELECTED RMS.

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- (C) MISSION:
FIRST FAILURE - NO EFFECT
- (D) CREW, VEHICLE, AND ELEMENT(S):
FIRST FAILURE - NO EFFECT
- (E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF MISSION (2R3) DUE TO LOSS OF ALL PAYLOAD CAPTURE
CAPABILITY AFTER SUBSEQUENT FAILURE OF BACKUP CIRCUITRY. POSSIBLE LOSS
OF CREW/VEHICLE (1R2) DUE TO UNCOMMANDED RELEASE OF A CAPTURED PAYLOAD
OR UNCOMMANDED MOTION OF THE RMS AFTER SECOND FAILURE (BACKUP CIRCUITRY
FAILS).

 - DISPOSITION RATIONALE -

- (A) DESIGN:
REFER TO APPENDIX B, ITEM NO. 2 - REMOTE POWER CONTROLLER
 - (B) TEST:
REFER TO APPENDIX B, ITEM NO. 2 - REMOTE POWER CONTROLLER

GROUND TURNAROUND TEST
CIRCUIT VERIFIED ON-LINE PER PARAGRAPHS:
 - V54AND.013 "PORT MN B (BACKUP) POWER VERIF"
 - V54AND.042 "PORT B/UP POWER DEADFACE VERIF"
 - V54AND.043 "STBD B/UP POWER DEADFACE VERIF"
 PRIOR TO MECHANICAL ARM INSTALLATION, AND LRU RETEST PER TABLE
 V54Z00.000.
 - (C) INSPECTION:
REFER TO APPENDIX B, ITEM NO. 2 - REMOTE POWER CONTROLLER
 - (D) FAILURE HISTORY:
REFER TO APPENDIX B, ITEM NO. 2 - REMOTE POWER CONTROLLER
 - (E) OPERATIONAL USE:
FAILURE OF THE BACKUP RPC WILL NOT BE DETECTABLE UNLESS THE CREW
ATTEMPTS TO DRIVE THE RMS USING THE BACKUP DRIVE SWITCH WITH PRIME
POWER SELECTED.
- | IF POSSIBLE, PAYLOADS SHOULD BE CAPTURED/RELEASED IN POSITIONS WHERE
 INCOMPLETE RIGIDIZATION OR RELEASE WILL NOT ALLOW THE PAYLOAD TO ROTATE
 INTO ORBITER STRUCTURE.

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- APPROVALS -

RELIABILITY ENGINEERING: T. AI
 DESIGN ENGINEERING : D. SOVEREIGN
 QUALITY SUPERVISOR for J. T. COURSEN
 NASA RELIABILITY : J. Gishorn
 NASA SUBSYSTEM MANAGER : G. A. Gilman
 NASA EPD&C RELIABILITY :
 NASA QUALITY ASSURANCE :
 NASA EPD&C SUBSYS MGR :

: IA McNamee CL the 5-2-91
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 : WPA / Bill J. 6/2/91
 : T.R. / [unclear] 6/11/91
 : [unclear] M. [unclear] 8/7/91
 : M. Sa [unclear] [unclear] 8/7/91
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 : J. G. [unclear] FOR F. [unclear]