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PRINT DATE: 07/23/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: 05-61A-2003-X

SUBSYSTEM NAME: EPD&C - REMOTE MANIP. ARM

REVISION : 2 07/23/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
● LRU :	PANEL ABA2	VOB2-73D150
■ SRU :	FUSE	ME451-0018-0200 ✓

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
FUSE (2 AMP) RMS POWER CONTROL CIRCUIT, PRIMARY

REFERENCE DESIGNATORS: 36V73ABA2F1

QUANTITY OF LIKE ITEMS: 1
ONE

FUNCTION:
CONDUCTS CONTROL CIRCUIT CURRENT AND PROVIDES CIRCUIT PROTECTION FOR
REMOTE MANIPULATOR ARM PRIMARY POWER CONTROL CIRCUIT.

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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6IA-2003-01

SUBSYSTEM: EPD&C - REMOTE MANIP. ARM
LRU : PANEL A8A2
ITEM NAME: FUSE

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CRITICALITY OF THIS
FAILURE MODE: 1/1

- FAILURE MODE:
FAILS OPEN, FAILS TO CONDUCT

MISSION PHASE:
00 ON-ORBIT

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

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

- CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

PASS/FAIL RATIONALE:

A)

B)

C)

- FAILURE EFFECTS -

- (A) SUBSYSTEM:
FAILURE WILL INTERRUPT POWER TO THE PRIMARY RMS CONTROL BUS.

(B) INTERFACING SUBSYSTEM(S):
FAILURE WILL PREVENT USE OF THE PRIMARY RMS CONTROL SYSTEM WHEN
REQUIRED. FAILURE DURING PAYLOAD CAPTURE OR RELEASE MAY ALLOW CAPTURE
BUT INCOMPLETE RIGIDIZATION OF PAYLOAD WITH RMS END EFFECTOR. THE
BRAKES WILL COME ON AND SAFING WILL BE INDICATED. NO ARM RELATED DATA

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WILL BE DISPLAYED ON THE J&C PANEL. END EFFECTOR TALKBACKS WILL BE BARBER POLE. IF FAILURE OCCURS DURING OPERATION, ARM WILL STOP, ALL PRIME MODES WILL BE LOST, AND END EFFECTOR PRIME MODES WILL BE LOST. IF CAPTURING A PAYLOAD, INCOMPLETE RIGIDIZATION CAN OCCUR RESULTING IN UNEXPECTED MOTION.

- (C) MISSION:
FAILURE WILL RESULT IN LOSS OF MISSION SINCE BASELINE MISSION CANNOT BE PERFORMED WITH THE BACKUP RMS CONTROL SYSTEM.
- (D) CREW, VEHICLE, AND ELEMENT(S):
FAILURE COULD RESULT IN LOSS OF CREW OR VEHICLE DUE TO UNEXPECTED RMS OR PAYLOAD MOTION DUE TO INCOMPLETE RIGIDIZATION.

(E) FUNCTIONAL CRITICALITY EFFECTS:

- DISPOSITION RATIONALE -

- (A) DESIGN:
REFER TO APPENDIX D, ITEM NO. 4 - FUSE, PLUG-IN
 - (B) TEST:
REFER TO APPENDIX D, ITEM NO. 4 - FUSE, PLUG-IN
- GROUND TURNAROUND TEST
CIRCUIT VERIFIED ON LINE PER PARAGRAPHS:
- V54AND.012 "PORT MN A (PRIMARY) POWER VERIF" (PRIOR TO THE MECHANICAL ARM INSTALLATION)
- V54ATD.001 "CONFIGURATION AND CHECKOUT" (EVERY RMS FLIGHT)
AND LRU RETEST PER TABLE V54200.000.
- (C) INSPECTION:
REFER TO APPENDIX D, ITEM NO. 4 - FUSE, PLUG-IN ✓
 - (D) FAILURE HISTORY:
REFER TO APPENDIX D, ITEM NO. 4 - FUSE, PLUG-IN

(E) OPERATIONAL USE:
FAILURE WILL BE NOTED BY LOSS OF MCIU FUNCTION AND LACK OF RMS RESPONSE IN PRIME POWER. SUBSEQUENT FAILURE OF THE BACKUP RELEASE SYSTEM WILL REQUIRE IMMEDIATE JETTISON OF RMS TO PREVENT LOSS OF VEHICLE DUE TO UNCONTROLLABLE PAYLOAD MOTION. FOR UNLOADED RMS OPERATIONS, SUBSEQUENT LOSS OF BACKUP RMS DRIVE SYSTEM MAY REQUIRE EVA OR JETTISON OF RMS FOR SAFE ENTRY.

IF possible, PAYLOADS SHOULD BE CAPTURED/RELEASED IN POSITIONS WHERE INCOMPLETE

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RIGIDIZATION OR RELEASE WILL NOT ALLOW THE PAYLOAD TO ROTATE INTO
 ORBITER STRUCTURE.

 - APPROVALS -

RELIABILITY ENGINEERING:	T. AT	:	<u>TA Michael Chittos</u>
DESIGN ENGINEERING	: D. SOVEREIGN	:	<u>DS [Signature] 8-1-90</u>
QUALITY SUPERVISOR	: J. COURSEN	:	<u>JC [Signature] 9/10/90</u>
NASA RELIABILITY	: J. BRISHAM	:	<u>JB [Signature] 9/10/90</u>
NASA SUBSYSTEM MANAGER	: G. GIOIA	:	<u>GJ [Signature] 10/10/90</u>
NASA EPD&C RELIABILITY	:	:	<u>M. [Signature] [Signature] 9/26/90</u>
NASA QUALITY ASSURANCE	:	:	<u>KO Grant Bonjemet 9/10/90</u>
NASA EPD&C SUBSYS MGR	: F. ALANIS	:	<u>FA [Signature] for FA 10/16/90</u>
NASA RMS operations	: D. PALLERKA	:	<u>D. Pallerka</u>