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PRINT DATE: 08/24/93

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE
NUMBER: 06-6ED-2127-X

SUBSYSTEM NAME: EPD&C - ET UMBILICAL DOORS

REVISION: 5 08/24/93

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: AFT MCA-1	V070-765410
LRU	: AFT MCA-2	V070-765420
LRU	: AFT MCA-3	V070-765430
LRU	: AFT MCA-3	V070-765600
LRU	: AFT MCA-2	V070-765620
LRU	: AFT MCA-1	V070-765630
SRU	: RELAY, HYBRID	MC455-0135-0001
SRU	: RELAY, HYBRID	MC455-0135-0002

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
RELAY, HYBRID, 4 POLE, NON-LATCH, CENTERLINE LATCHES - STOW CIRCUITS

REFERENCE DESIGNATORS: 54V76A114K7
54V76A114K8
54V76A114K12
54V76A114K13
55V76A115K15
55V76A115K16
56V76A116K7
56V76A116K8

QUANTITY OF LIKE ITEMS: 8
EIGHT

FUNCTION:
TWO HYBRID RELAYS ARE USED IN SERIES TO CONNECT THREE-PHASE AC POWER TO EACH CENTERLINE LATCH ACTUATOR DRIVE FOR THE ROTATE AND STOW OPERATIONS.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL FAILURE MODE
NUMBER: 05-8ED-2127-03**

SUBSYSTEM NAME: EPD&C - ET UMBILICAL DOORS
LRU : AFT MCA-1
ITEM NAME: RELAY, HYBRID

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**CRITICALITY OF THIS
FAILURE MODE: 1R3**

**FAILURE MODE:
SHORTS CONTACT-TO-CONTACT**

MISSION PHASE:
 LO LIFT-OFF
 DO DE-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 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN

A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:
 A)

B)
 FAILS SCREEN "B" BECAUSE NO CAPABILITY EXISTS TO DETECT THE FAILED RELAY
 INFIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
 FIRST FAILURE - NO EFFECT

(B) INTERFACING SUBSYSTEM(S):
 FIRST FAILURE - NO EFFECT

(C) MISSION:
 FIRST FAILURE - NO EFFECT

(D) CREW, VEHICLE, AND ELEMENT(S):
 FIRST FAILURE - NO EFFECT

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL FAILURE MODE
NUMBER: 06-0ED-2127-03**

(E) FUNCTIONAL CRITICALITY EFFECTS:

- 1) HYBRID RELAY SHORTS CONTACT-TO-CONTACT
- 2) SECOND CONTACT SET FAILS SHORTED ON THE SAME HYBRID RELAY
- 3) REDUNDANT RELAY IN SERIES FAILS CLOSED

POSSIBLE LOSS OF CREW/VEHICLE DUE TO PREMATURE STOWING ONE OF TWO CENTERLINE LATCHES DURING ASCENT PHASE PARTIALLY RELEASING AND SUBJECTING LESS RESTRAINED ET DOORS TO BOOST ENVIRONMENT. POSSIBLE DOOR DAMAGE OR LOSS COULD OCCUR DURING ASCENT PHASE WHEN THE DOORS ARE NOT SECURED BY BOTH CENTERLINE LATCHES. POSSIBLE LOSS OF CREW/VEHICLE DUE TO STRUCTURAL DAMAGE CAUSED BY THERMAL EFFECTS IF ET DOORS CANNOT BE CLOSED FOR SAFE ENTRY.

-DISPOSITION RATIONALE-

(A) DESIGN:

REFER TO APPENDIX C, ITEM NO. 1 - HYBRID RELAY

(B) TEST:

REFER TO APPENDIX C, ITEM NO. 1 - HYBRID RELAY

GROUND TURNAROUND TEST

NONE

(C) INSPECTION:

REFER TO APPENDIX C, ITEM NO. 1 - HYBRID RELAY

(D) FAILURE HISTORY:

REFER TO APPENDIX C, ITEM NO. 1 - HYBRID RELAY

(E) OPERATIONAL USE:

NONE

- APPROVALS -

EDITORIALLY APPROVED	: RI
EDITORIALLY APPROVED	: JSC
TECHNICAL APPROVAL	: VIA CR

Handwritten signature and date:
 [Signature] 8/24/93
 :S50270L