

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE

NUMBER:05-60-200716 -X

SUBSYSTEM NAME: EPD&C-GUIDANCE, NAVIGATION, & CONTROL (05-1)

REVISION: 0 07/12/88

PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:AFT MCA-1	V070-765410
LRU	:AFT MCA-2	V070-765420
LRU	:AFT MCA-2	V070-765620
LRU	:AFT MCA-1	V070-765630
SRU	:RELAY MODULE	ME455-0131-0002
SRU	:RELAY MODULE	ME455-0131-0003
SRU	:RELAY MODULE	ME455-0131-1002
SRU	:RELAY MODULE	ME455-0131-1003

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
RELAY MODULE, ATVC DEADFACE

REFERENCE DESIGNATORS: 55V76A115K97
55V76A115K98
54V76A114K97
54V76A114K98

QUANTITY OF LIKE ITEMS: 4
FOUR - ONE PER ATVC

FUNCTION:
CONTROLS THE LATCHING RELAY WHICH PROVIDES A DEADFACING FUNCTION TO THE 26 VOLTS AC EXCITATION POWER FROM THE ATVC'S TO THE SRB DIFFERENTIAL PRESSURE TRANSDUCERS FOLLOWING SRB SEPARATION.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-60-200716-02

REVISION#: 1 01/22/96

SUBSYSTEM NAME: EPD&C-GUIDANCE, NAVIGATION, & CONTROL (05-1)

LRU: AFT MCA-1, 2

CRITICALITY OF THIS

ITEM NAME: RELAY MODULE

FAILURE MODE: 1R2

FAILURE MODE:

SHORTS TO GROUND, FAILS TO TRANSFER.

MISSION PHASE: LO LIFT-OFF

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) PASS
	C) PASS

PASS/FAIL RATIONALE:

A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

LOSS OF ONE OF FOUR ATVC POWER SUPPLIES.

(B) INTERFACING SUBSYSTEM(S):

LOSS OF ONE OF FOUR ATVC'S DUE TO THE 28 VOLT AC POWER SUPPLY SHORT. THE REMAINING ATVC CHANNELS STILL OPERATE TO MAINTAIN STABILITY.

(C) MISSION:

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NO EFFECT.

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

NO EFFECT FOR FIRST FAILURE. SECOND FAILURE (LOSS OF ANOTHER ATVC AND ITS ASSOCIATED ISOLATION VALVE DRIVER. DUE TO AN ATVC POWER SWITCH FAILURE WHERE ALL THREE CONTACTS ARE SHORTED TO GROUND) COULD RESULT IN SEQUENTIAL BYPASSING OF GOOD CHANNELS AND SUBSEQUENT LOSS OF CONTROL. THE REMAINING GOOD CHANNELS (TWO) AS A RESULT OF THE SECOND FAILURE MOST LIKELY COULD SEQUENTIALLY EXCEED THE ATVC-FDI TRIP LEVEL (2200PSI), RESULTING IN AN ADDITIONAL CHANNEL BYPASS DUE TO A TWO AGAINST ONE FORCE FIGHT CONDITION. THIS SECOND FAILURE EFFECT ASSUMES A WORST CASE ANALYSIS WHERE ONE OF THE REMAINING GOOD CHANNELS EXCEEDS ITS TRIP LEVEL AS A RESULT OF TOLERANCE CONDITIONS BETWEEN CHANNELS AND SUBSEQUENTLY BYPASSED BY THE DATA PRESSURE MONITOR.

(E) FUNCTIONAL CRITICALITY EFFECTS:

CRITICALITY 1R BECAUSE LOSS OF MPS AND SRB THRUST VECTOR CONTROL MAY CAUSE LOSS OF CREW/VEHICLE.

-DISPOSITION RATIONALE-

(A) DESIGN:

REFER TO APPENDIX C, ITEM NO. 4 - RELAY MODULE (MC455-0131).

(B) TEST:

REFER TO APPENDIX C, ITEM NO. 4 - RELAY MODULE (MC455-0131).

GROUND TURNAROUND TEST

PROPER OPERATION OF THE RELAY IS VERIFIED DURING GROUND TURNAROUND TESTING.

(C) INSPECTION:

REFER TO APPENDIX C, ITEM NO. 4 - RELAY MODULE (MC455-0131).

(D) FAILURE HISTORY:

REFER TO APPENDIX C, ITEM NO. 4 - RELAY MODULE (MC455-0131).

(E) OPERATIONAL USE:

REMAINING FCS CHANNEL SWITCHES TO BE PLACED IN "OVERRIDE" SEE FLIGHT RULE 8-52 (D) & (E).

- APPROVALS -

EDITORIALLY APPROVED

: RI

: Amelia 1/31/96

EDITORIALLY APPROVED

: JSC

: Sam Army 2-18-96

TECHNICAL APPROVAL

: APPROVAL FORM

: 95-CIL-004-R1