

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE  
 NUMBER: 05-6S-B5W7 -X

SUBSYSTEM NAME: EPD&amp;C - DPS&amp;C

REVISION: 0 12/02/87

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 PART DATA
 

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	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: D&C PANEL O6	V070-730389
SRU	: SWITCH, TOGGLE	ME452-0102-7301

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EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:  
 SWITCH, POWER, TOGGLE, 3P2P, GENERAL PURPOSE COMPUTER POWER "ON-OFF"

REFERENCE DESIGNATORS: 33V73A6S30  
 33V73A6S31  
 33V73A6S32  
 33V73A6S33  
 33V73A6S34

QUANTITY OF LIKE ITEMS: 5  
 FIVE ON PANEL O6

FUNCTION:  
 PROVIDES CONTROL FOR THE DRIVER MODULE WHICH TURNS THE REMOTE POWER CONTROLLER'S (RPC) "ON" IN THE GPC'S POWER CIRCUITS. ALSO PROVIDES POWER TO HALT RELAY AND TERMINATE SWITCH.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-6S-BSW7-01

REVISION#: 0 04/12/96

SUBSYSTEM NAME: EPD&C - DPS&C

LRU: D & C PANEL 06

ITEM NAME: SWITCH, TOGGLE

CRITICALITY OF THIS

FAILURE MODE: 1R2

FAILURE MODE:

FAILS OPEN, PREMATURE OPEN OR SHORTS TO CASE (GROUND). (ALL SETS OF CONTACTS).

MISSION PHASE:	PL	PRE-LAUNCH
	LO	LIFT-OFF
	OO	ON-ORBIT
	DO	DE-ORBIT
	LS	LANDING/SAFING

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

CAUSE:

PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY.

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:

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CONTROL OF THE RPC DRIVER MODULE IS LOST. THE RPC CANNOT BE TURNED ON BY THE CREWMAN.

**(B) INTERFACING SUBSYSTEM(S):**

POWER TO THE GENERAL PURPOSE COMPUTER (GPC) IS LOST. LOSS OF STRINGS (DATA BUSES) ASSIGNED TO FAILED GPC.

**(C) MISSION:**

LOSS OF ONE GPC NO EFFECT. TWO GPC'S RESULT IN MINIMUM DURATION FLIGHT. THREE GPC'S RESULTS IN ENTRY TO NEXT PRIMARY LANDING SITE.

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

PRIMARY AVIONICS SOFTWARE SYSTEM (PASS): NO EFFECT FIRST FAILURE.

BACKUP FLIGHT SYSTEM (BFS) (PRE-ENGAGE): NO DIRECT EFFECT ON CREW/VEHICLE. ABILITY TO ENGAGE BFS IS LOST. LOSS OF POWER TO BFS GPC.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

CRITICALITY 1R2 BECAUSE OF THE FOLLOWING REASONS:

**FOR ASCENT/ENTRY:**

THIS FAILURE COUPLED WITH AN UNDETECTED FLIGHT CONTROL SYSTEM (FCS) FAILURE IN THE NULL (ZERO OUTPUT) POSITION (E.G., IN THE AEROSURFACE AMPLIFIER (ASA) OR ASCENT THRUST VECTOR CONTROLLER (ATVC)), COULD RESULT IN THE TWO HEALTHY PATHS BEING VOTED OUT. THIS COULD RESULT IN A VOTING DILEMMA IN THE FCS (E.G., "FORCE FIGHT" IN THE SERVO ACTUATORS. REFERENCE FMEA 05-1-FC6042-1 AND 05-1-FC6542-1).

**FOR ASCENT:**

DURING INTACT ABORT (RTL, TAL OR AOA), CRITICALITY 1 IF UNABLE TO PURGE AFT FUSELAGE COMPARTMENTS OF POST MECO GAS MIXTURE (BY OPENING HELIUM BLOW DOWN VALVE) RESULTING IN POSSIBLE FIRE/EXPLOSION AND MAY RESULT IN LOSS OF VEHICLE & CREW ((FLIGHT AFT) FA3 OR FA4 MULTIPLEXER DEMULTIPLEXER (MDM)).

**ALL PHASES:**

LOSS OF OUTPUT FROM ONE INERTIAL MEASUREMENT UNIT (IMU) OR A FLIGHT FORWARD (FF) MDM CHANNEL PROCESSING IMU DATA, FOLLOWED BY FAILURE OF ANOTHER IMU OR FF MDM WITH ERRONEOUS OUTPUT SUCH THAT THE AVERAGE OF THE TWO REMAINING CHANNELS IS CORRUPTED, WILL LEAD TO INCORPORATION OF FAULTY IMU DATA BY ALL COMPUTERS AND POSSIBLE LOSS OF VEHICLE/CREW.

**FOR BFS:**

AFTER LOSS OF PASS DUE TO GENERIC FAILURE(S), BFS ENGAGE IS REQUIRED. ANY SUBSEQUENT FAILURE IN THE BFS LEADS TO INABILITY TO CONTROL THE VEHICLE AND RESULTS IN LOSS OF CREW/VEHICLE.

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE  
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-DISPOSITION RATIONALE-

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(A) DESIGN:  
FOR DISPOSITION AND RATIONALE, REFER TO APPENDIX A, ITEM NO. 1-TOGGLE SWITCH.

(B) TEST:  
FOR DISPOSITION AND RATIONALE, REFER TO APPENDIX A, ITEM NO. 1-TOGGLE SWITCH.

GROUND TURNAROUND TEST: ALL TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:  
FOR DISPOSITION AND RATIONALE, REFER TO APPENDIX A, ITEM NO. 1-TOGGLE SWITCH.

(D) FAILURE HISTORY:  
CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACA DATABASE.

FOR DISPOSITION AND RATIONALE, REFER TO APPENDIX A, ITEM NO. 1-TOGGLE SWITCH.

(E) OPERATIONAL USE:  
PRIOR TO THE FAILURE OF THIS PART, FLIGHT CRITICAL STRINGS (PAIRS OF DATA BUSES) ARE DISTRIBUTED AMONG THE OPERATING GN&C REDUNDANT SET IN AN ATTEMPT TO LIMIT THE EXPOSURE TO THE NEXT FAILURE. FOLLOWING A FAILURE OF THIS PART, THE FLIGHT CRITICAL STRINGS ARE REDISTRIBUTED IN AN ATTEMPT TO LIMIT EXPOSURE TO THE NEXT FAILURE. NO SPECIAL CREW TRAINING IS REQUIRED.

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- APPROVALS -

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

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