

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE****NUMBER: 05-6J-2162 -X****SUBSYSTEM NAME: D&C - MAIN PROPULSION SYSTEM****REVISION: 1 02/22/01**

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**PART DATA**

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	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	: PANEL R2	V070-730277
SRU	: SWITCH, TOGGLE	ME452-0102-7201 ME452-0102-8201

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

SWITCH, TOGGLE (TWO POLES, THREE POSITIONS, LEVER LOCKED) MPS PROPELLANT DUMP SEQUENCE CONTROL CIRCUIT.

**REFERENCE DESIGNATORS:** 32V73A2S1**QUANTITY OF LIKE ITEMS:** 1**FUNCTION:**

PROVIDES MANUAL "START" AND "STOP" CONTROL OF MPS PROPELLANT DUMP SEQUENCE CONTROL CIRCUIT.

**FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE**

**NUMBER: 05-6J-2162-02**

**REVISION#:** 1 09/17/01

**SUBSYSTEM NAME:** D&C - MAIN PROPULSION SYSTEM

**LRU:** PANEL R2

**CRITICALITY OF THIS**

**ITEM NAME:** MPS DUMP SEQUENCE TOGGLE SWITCH

**FAILURE MODE:** 1R2

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**FAILURE MODE:**

CONTACT-TO-CONTACT SHORT (BOTH "START" POLES)

**MISSION PHASE:** LO LIFT-OFF

<b>VEHICLE/PAYLOAD/KIT EFFECTIVITY:</b>	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? YES**

RTLS RETURN TO LAUNCH SITE

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<b>REDUNDANCY SCREEN</b>	A) PASS
	B) PASS
	C) PASS

**PASS/FAIL RATIONALE:**

A)

B)

C)

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**- FAILURE EFFECTS -**

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**(A) SUBSYSTEM:**

LOSS OF MANUAL "STOP" COMMAND CAPABILITY OF MPS PROPELLANT DUMP SEQUENCE CONTROL CIRCUIT.

CRITICALITY 1/1 FOR RTLS ABORTS; SWITCH FAILURE RESULTING IN INADVERTANT DUMP "START" COMMAND PREVENTS THE INITIATION OF LO2 DUMP DUE TO THE RTLS SOFTWARE READING THE DUMP SWITCH IN "START" AS A CUE FOR THE PERFORMANCE OF AN RTLS

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CONTINGENCY BAILOUT SCENARIO REQUIRING THE RETENTION OF LO2 FOR VEHICLE CG CONTROL. THE INADVERTENT FAILURE TO DUMP LO2 MAY CAUSE VIOLATION OF MAXIMUM DOWNWEIGHT FOR HEAVY MANIFESTED PAYLOADS.

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

NO EFFECT - FIRST FAILURE.

**(C) MISSION:**

NO EFFECT - FIRST FAILURE.

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

NO EFFECT - FIRST FAILURE.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

1R/2 2 SUCCESS PATHS. TIME FRAME - POST MECO/MPS DUMP

- 1) FAILURE REQUIRING DELAY OF ET SEPARATION DELAY INTO MECO+20 SECONDS - MPS DUMP TIMEFRAME.
- 2) DUMP SWITCH FAILS IN "START" POSITION AT SAME TIME AS ET SEP INITIATION, POSSIBLY RESULTING IN INITIATION OF DUMP COINCIDING WITH MANUAL ET SEP.

RESULTS IN POSSIBLE ET/ORBITER RE-CONTACT AND POTENTIAL STRUCTURAL OR THERMAL PROTECTION SYSTEM DAMAGE. POSSIBLE LOSS OF CREW/VEHICLE.

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**-DISPOSITION RATIONALE-**

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**(A) DESIGN:**

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

**(B) TEST:**

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

GROUND TURNAROUND TEST

ANY TURNAROUND CHECKOUT IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

**(C) INSPECTION:**

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

**(D) FAILURE HISTORY:**

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

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**(E) OPERATIONAL USE:**  
NO CREW ACTION CAN BE TAKEN.

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**- APPROVALS -**

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S&R ENGINEERING	: W.P. MUSTY	:/S/ W.P. MUSTY
S&R ENGINEERING ITM	: P. A. STENGER-NGUYEN	:/S/ P.A. STENGER-NGUYEN
D&C ENGINEERING	: LAITH COTTA	:/S/ LAITH COTTA
MPS SUBSYSTEM MGR.	: TIM REITH	:/S/ TIM REITH
EPD&C SUBSYSTEM MGR.	: RICHARD PHAN	:/S/ RICHARD PHAN
MOD	: JEFF MUSLER	:/S/ JEFF MUSLER
USA SAM	: MIKE SNYDER	:/S/ MIKE SNYDER
USA ORBITER ELEMENT	: SUZANNE LITTLE	:/S/ SUZANNE LITTLE
NASA SR&QA	: ERICH BASS	:/S/ ERICH BASS