

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE****NUMBER: 05-6J-2033 -X****SUBSYSTEM NAME:** EPD&C - MAIN PROPULSION SYSTEM**REVISION:** 0 07/27/00

---

**PART DATA**

---

	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	: AFT PCA 4, 5, 6	V070-765280
SRU	: RELAY, GENERAL PURPOSE	MC455-0129-0001

---

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**RELAY, GENERAL PURPOSE, GH2/GO2 FLOW CONTROL VALVE (LV53/54/55/56/57/58)  
CLOSE SOLENOID.

**REFERENCE DESIGNATORS:**

- 54V76A134K1
- 55V76A134K2
- 56V76A135K1
- 54V76A135K2
- 54V76A136K1
- 54V76A136K2

**QUANTITY OF LIKE ITEMS:** 6**FUNCTION:**PROVIDES OUPUT TO SIGNAL CONDITIONER FROM EITHER PRIMARY OR STANDBY ULLAGE  
PRESSURE TRANSDUCER.

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

**NUMBER: 05-6J-2033-03**

**REVISION#:** 0 01/17/01

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

**LRU:** AFT PCA 4, 5, 6

**CRITICALITY OF THIS**

**ITEM NAME:** GH2/GO2 ULLAGE PRESSURE CONTROL RELAY

**FAILURE MODE:** 1R2

---

**FAILURE MODE:**

LOSS OF OUTPUT, SHORTS TO GROUND

**MISSION PHASE:** LO LIFT-OFF

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

**CAUSE:**

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

**CRITICALITY 1/1 DURING INTACT ABORT ONLY?** NO

---

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

**PASS/FAIL RATIONALE:**

A)

B)

FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE.

C)

---

**- FAILURE EFFECTS -**

---

**(A) SUBSYSTEM:**

INADVERTENT SWITCHING OF NO. 4 TRANSDUCER.

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

NO EFFECT - FIRST FAILURE.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL FAILURE MODE  
NUMBER: 05-6J-2033-03**

**(C) MISSION:**

NO EFFECT - FIRST FAILURE.

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

NO EFFECT - FIRST FAILURE.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

CASE 1: LH2 FAILURES.

1R/2 2 SUCCESS PATHS. TIME FRAME - ASCENT.

- 1) RELAY FAILS CAUSING LOSS OF OUTPUT TO SIGNAL CONDITIONER, LOSS OF POWER TO FCV AND FCV CYCLING TO HIGH POSITION.
- 2) INADVERTENT DEACTUATION OF SECOND FLOW CONTROL VALVE.

RESULTS IN EXCESSIVE ULLAGE PRESSURE CAUSING ET VENT VALVE TO RELIEVE EXCESS PRESSURE. POTENTIAL FIRE/EXPLOSION HAZARD EXTERIOR TO THE VEHICLE. POSSIBLE VIOLATION OF THE ET MAXIMUM STRUCTURAL CAPABILITY REQUIREMENTS. POSSIBLE LOSS OF CREW/VEHICLE.

CASE 2: LO2 FAILURES. (ACTIVE GO2 VALVES ONLY)

1R/3 3 SUCCESS PATHS. TIME FRAME - ASCENT.

- 1) RELAY FAILS CAUSING LOSS OF OUTPUT TO SIGNAL CONDITIONER, LOSS OF POWER TO FCV AND FCV CYCLING TO HIGH POSITION.
- 2) INADVERTENT DEACTUATION OF SECOND FLOW CONTROL VALVE.
- 3) FAILURE OF ET LO2 VENT VALVE TO RELIEVE.

EXCESSIVE LO2 ULLAGE PRESSURE MAY EXCEED LO2 TANK STRUCTURAL LIMITS. FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF CREW/VEHICLE.

---

**-DISPOSITION RATIONALE-**

---

**(A) DESIGN:**

REFER TO APPENDIX C, ITEM NO. 2 - GENERAL PURPOSE RELAY.

**(B) TEST:**

REFER TO APPENDIX C, ITEM NO. 2 - GENERAL PURPOSE RELAY.

GROUND TURNAROUND TEST

ANY TURNAROUND CHECKOUT IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

**(C) INSPECTION:**

REFER TO APPENDIX C, ITEM NO. 2 - GENERAL PURPOSE RELAY.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL FAILURE MODE  
NUMBER: 05-6J-2033-03**

**(D) FAILURE HISTORY:**

REFER TO APPENDIX C, ITEM NO. 2 - GENERAL PURPOSE RELAY.

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

**(E) OPERATIONAL USE:**

NO CREW ACTION CAN BE TAKEN FOR FAILURES WHICH RESULT IN EXCESSIVE GH2/GO2 ULLAGE PRESSURE.

---

**- APPROVALS -**

---

S&R ENGINEERING	: W.P. MUSTY	:/S/ W.P. MUSTY
S&R ENGINEERING ITM	: P. A. STENGER-NGUYEN	:/S/ P.A. STENGER-NGUYEN
DESIGN ENGINEERING	: ANDY RIZVI	:/S/ ANDY RIZVI
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	: MICHAEL SNYDER	:/S/ MICHAEL SNYDER
USA ORBITER ELEMENT	: SUZANNE LITTLE	:/S/ SUZANNE LITTLE
NASA SR&QA	: BILL PRINCE	:/S/ BILL PRICE