

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE
NUMBER:04-2-RV02 -X

SUBSYSTEM NAME: AUXILIARY POWER UNIT (APU)

REVISION: 1 09/17/98

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	:RELIEF VALVE WRIGHT COMPONENTS	ME284-0544 0002/0003 11292-1/-2

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

RELIEF VALVE IS IN THE APU FUEL PUMP SEAL CAVITY DRAIN SYSTEM BETWEEN THE BURST DISK AND OVERBOARD VENT AND RELIEVES AT 28 TO 42 PSIA.

QUANTITY OF LIKE ITEMS: 3
ONE PER APU

FUNCTION:

CONTAINS AND RELIEVES THE PRESSURE AT 28 TO 42 PSIA IN THE APU FUEL PUMP SEAL CAVITY DRAIN SYSTEM IF SUFFICIENT FUEL HAS LEAKED THROUGH THE PUMP SEAL TO CRACK THE OVERBOARD RELIEF VALVE.

**FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE
NUMBER: 04-2-RV02-02**

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SUBSYSTEM NAME: AUXILIARY POWER UNIT (APU)
LRU: RELIEF VALVE
ITEM NAME: RELIEF VALVE

CRITICALITY OF THIS
FAILURE MODE: 1R3

FAILURE MODE:
FAILS OPEN/INTERNAL LEAK

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:
CONTAMINATION, VIBRATION

CRITICALITY 1/3 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN

A) PASS
B) N/A
C) PASS

PASS/FAIL RATIONALE:

- A)
RELIEF VALVE CAN BE FUNCTIONALLY TESTED THROUGH THE TEST PORT OF THE BURST DISK AT VEHICLE TURN AROUND.
- B)
N/A - STANDBY REDUNDANT ITEM
- C)
A SINGLE CREDIBLE EVENT CANNOT CAUSE LOSS OF ALL RELIEF VALVE REDUNDANCY.

- FAILURE EFFECTS -

(A) SUBSYSTEM:
NONE FOR THE FIRST FAILURE.

(B) INTERFACING SUBSYSTEM(S):
NONE FOR THE FIRST FAILURE.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-OIL FAILURE MODE
NUMBER: 04-2-RV02-02**

(C) MISSION:

NONE WITHOUT ADDITIONAL FAILURES.

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

NONE WITHOUT ADDITIONAL FAILURES.

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF BOTH MISSION AND CREW/VEHICLE AFTER 5 FAILURES:

- (1) RELIEF VALVE FAILS OPEN OR HAS INTERNAL LEAK.
- (2) GROSS INTERNAL LEAK THROUGH BURST DISK OR BURST DISK RUPTURES PREMATURELY.
- (3) STATIC FUEL PUMP SEAL LEAK CAUSING FUEL PUMP INLET PRESSURE < 15 PSIA.
- (4) ANOTHER APU FAILS OR LANDING/DECEL REDUNDANCY IS LOST, NECESSITATING USE OF APU WITH F/P STATIC LEAK.
- (5) WHEN ISOLATION VALVES ARE OPENED ON AFFECTED APU, ADIABATIC BUBBLE COMPRESSION DETONATION (ABCD) OCCURS.

- APPROVALS -

SS & PAE MANAGER	<i>KE</i> : D. F. MIKULA
SS & PAE ENGINEER	: K. E. RYAN
VEHICLE & SYSTEMS DESIGN	: M. A. WEISER
BNA SSM	: T. FARKAS, JR.
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