

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE

NUMBER: M4-1BG-VP045 -X

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC

REVISION: 2 03/28/98

PART DATA

PART NAME	PART NUMBER
VENDOR NAME	VENDOR NUMBER
LRU :VENT, H2, NO. 2	V544-454154-001

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
RELIEF VALVE, H2 MANIFOLD**REFERENCE DESIGNATORS:** 40V4SVP045**QUANTITY OF LIKE ITEMS:** 1
ONE PER VEHICLE**FUNCTION:**
PROVIDES OVERPRESSURIZATION PROTECTION OF H2 MANIFOLD AND LINES

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: M4-1BG-VP045-01

REVISION#: 1 03/27/96

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC

LRU: VENT, H2, NO. 2

CRITICALITY OF THIS

ITEM NAME: VENT, H2, NO. 2

FAILURE MODE: 1R2

**FAILURE MODE:
PLUGGED OR RESTRICTED**

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**

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN

A) PASS
B) N/A
C) PASS

PASS/FAIL RATIONALE:

A)

B)

REDUNDANCY SCREEN B - N/A SINCE PORT PROVIDES RELIEF PATH FOR H2 TANK ASSEMBLY 3, 5, 6, 7, 8, 9

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

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SUBSYSTEM DEGRADATION - LOSS OF H2 TANK # 3, 5, 6, 7, 8, 9 PRIMARY RELIEF CAPABILITY.

(B) INTERFACING SUBSYSTEM(S):
NO EFFECT AFTER FIRST FAILURE

(C) MISSION:
NO EFFECT AFTER FIRST FAILURE

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT AFTER FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE DUE TO H2 TANK RUPTURE IF AN ADDITIONAL FAILURE RESULTS IN TANK OVERPRESSURIZATION.

-DISPOSITION RATIONALE-

(A) DESIGN:
45 MICRON FILTER SCREEN IN RELIEF VALVE. VENT PORT IS A 3/4 INCH FITTING WHICH CONNECTS TO A DYNATUBE FITTING AND THEN THROUGH SEVERAL FEET OF 5/8 INCH TUBING TO THE RELIEF VALVE. ALL CRES CONSTRUCTION. CAP IS INSTALLED DURING FERRY FLIGHT. RELIEF LINE IS ANGLED DOWNWARD TO THE PORT IN VERTICAL AND HORIZONTAL VEHICLE ORIENTATIONS TO PREVENT COLLECTION OF RAINWATER.

(B) TEST:
PLUMBING ASSEMBLY QUALIFICATION TEST INCLUDED; VIBRATION - RANDOM (0.01G SQ/HZ MAXIMUM), SINUSOIDAL (+/- 0.25 G PEAK) AND ACOUSTIC (25 TO 8000 HZ, 130-148 DB) FOR 175 MISSION EQUIVALENT, 100 THERMAL CYCLES (AMBIENT/CRYO/+200 DEG F/AMBIENT/CRYO/AMBIENT).

CRYO PLUMBING CLEANED AND VERIFIED TO LEVEL 200A BY PARTICLE COUNT AND NON-VOLATILE RESIDUE AFTER INSTALLATION. PREFLIGHT AND POST FLIGHT VISUAL CHECKS VERIFIED THAT VENT PORT IS OPEN.

OMRSD: DURING TURNAROUND, PERFORM VISUAL INSPECTION. MONITOR RELIEF VALVE CRACK TEST FOR FLOW DURING EVERY ORBITER MAINTENANCE DOWN PERIOD (OMDP) OR IF FLOW WAS REQUIRED DURING THE PREVIOUS FLIGHT.

(C) INSPECTION:
CONTAMINATION CONTROL

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CLEAN TO LEVEL 200A, OF CLEANING SPECIFICATION, AND MAINTAINED DURING ASSEMBLY. VERIFIED BY INSPECTION ON MANUFACTURING ORDERS.

(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 DATA BASE.

THERE HAVE BEEN NO ACCEPTANCE TEST, QUALIFICATION TEST, FIELD OR FLIGHT FAILURES ASSOCIATED WITH THIS FAILURE MODE.

(E) OPERATIONAL USE:

NO CREW ACTION AFTER FIRST FAILURE. AFTER THIRD FAILURE, CREW WILL DEACTIVATE ASSOCIATED TANK HEATERS IN RESPONSE TO HIGH PRESSURE FAULT ANNUNCIATION.

- APPROVALS -

PAE MANAGER	: D. F. MIKULA	<i>D.F. Mikula 29 Mar 96</i>
PRODUCT ASSURANCE ENGR	: L. X. DANG	<i>L.X. Dang 3/29/96</i>
DESIGN ENGINEERING	: G. AVILA	<i>G. Avila 3/28/96</i>
NASA SSMA	:	<i>W.B. Galt 6/16/97</i>
NASA SUBSYSTEM MANAGER	:	<i>Robert H. ... 6/16/97</i>