

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE ?
 NUMBER: G6-1B-0100-X

S030770H
 ATTACHMENT
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SUBSYSTEM NAME: RCRS FILTER/ADAPTER SET

REVISION : 1 09/03/91

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ LRU :	FILTER/ADAPTER ASSEMBLY	G070-581000
■ LRU :	FILTER/ADAPTER ASSEMBLY	G070-581001
■ LRU :	FILTER/ADAPTER ASSEMBLY	G070-581002

 PART DATA

- EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
 THE ECLSS FILTER/ADAPTER ASSEMBLY SET CONSISTS OF THREE ALMOST IDENTICAL ASSEMBLIES, EACH WHICH CONSISTS OF AN ASSEMBLY OF A 10 MICRON FILTER, FLEXIBLE TUBING, UNIONS, FITTINGS AND INTERFACE ADAPTERS WITH TETHERED PROTECTIVE CAP AND PLUG ENDS.
- REFERENCE DESIGNATORS:
 - : S1455TP1
 - : S1455TP2
 - : S1455TP3
- QUANTITY OF LIKE ITEMS: 3
 THREE, ONE FOR EACH TEST PORT ON THE RCRS.
- FUNCTION:
 THIS UNIT SUPPORTS THE SERVICING AND FUNCTIONAL CHECKOUT OF THE RCRS INCLUDING CO2 INJECTION, GN2 PURGE AND MEASUREMENT OF CO2 CONTENT OF INLET AND OUTLET AIR OF THE RCRS.

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SUBSYSTEM: RCRS FILTER/ADAPTER SET
LRU : FILTER/ADAPTER ASSEMBLY
ITEM NAME: FILTER/ADAPTER ASSEMBLY

CRITICALITY OF THIS
FAILURE MODE: 2 2

FAILURE MODE:
LEAKAGE (CO2/GH2)

MISSION PHASE:
GT GROUND TURNAROUND

VEHICLE/PAYLOAD/KIT EFFECTIVITY: EDO MISSION ONLY
: 102 COLUMBIA
: 105 ENDEAVOUR

CAUSE:
~~BROKEN/CRACKED LINES OR FILTER HOUSINGS, LEAKING SEALS/O-RINGS, SECS~~
~~LEAKAGE~~ CORROSION, CONTAMINATION, MECHANICAL SHOCK } U.S. LITIGATION

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) N/A
B) N/A
C) N/A

PASS/FAIL RATIONALE:

- A)
- B)
- C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF CAPABILITY FOR PROPER GH2 PURGING, CO2 INJECTION, OR MEASUREMENT OF CO2 CONTENT IN AIR ENTERING AND LEAVING RCRS.

(B) INTERFACING SUBSYSTEM(S):
LOSS OF PROPER TRANSFER OF GASES BETWEEN PNEUMATIC PANEL AND THE ORBITER OR CO2 ANALYZER. LOSS OF CO2 OR DILUTION OF GASES SAMPLED FROM THE RCRS BED OUTLET AIRSTREAM MAY CAUSE ERRONEOUS CO2 MEASUREMENT AND MASK THE FAILURE OF THE RCRS BED(S) TO REMOVE CO2 FROM THE RCRS INLET

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- (C) MISSION: ~~Support of the Mars Science Laboratory (MSL) mission to Mars. The MSL mission is a Mars Science Laboratory (MSL) mission to Mars. The MSL mission is a Mars Science Laboratory (MSL) mission to Mars.~~
~~N/A~~ ~~NO EFFECT FIRST~~ ~~Failure of the MSL mission to Mars.~~
- (D) CREW, VEHICLE, AND ELEMENT(S): ~~Systems - RESEMBLE C~~
POSSIBLE LOSS OF ~~PERSONNEL~~ ~~LIFE~~ DUE TO HIGH CONCENTRATION OF GN2-OR CO2 IN CREW COMPARTMENT.

■ (E) FUNCTIONAL CRITICALITY EFFECTS:

- DISPOSITION RATIONALE -

- (A) DESIGN:
ASSEMBLY IS DESIGNED TO WITHSTAND PRESSURES OF OVER THIRTY TIMES THE WORKING PRESSURE. ALL METAL PARTS ARE CRES, SEALS ARE TEFLON, AND FLEX HOSES ARE RUBBER JACKETED WITH A TEFLON LINER. ALL PARTS ARE CLEANED PER MA0110-301, LEVEL 200 PRIOR TO ASSEMBLY. FLUID FITTINGS, TUBING, AND FLEX HOSES ARE ASSEMBLED PER MA0102-306. FITTINGS USING TEFLON SEALS ARE TORQUED TO CLASS E, BOSS INSTALLED FITTINGS TO CLASS I, AND JAM NUT AN924-4 TO CLASS H. CLEANLINESS IS MAINTAINED TO MA0110-311.
- (B) TEST:
ASSEMBLY IS PROOF PRESSURE TESTED USING GN2 AT 150 PSIG FOR 3 MINUTES AND LEAKAGE TESTED AT 100 PSIG USING GN2 FOR ONE MINUTE, WITH LEAKAGE NOT TO EXCEED 10 TO THE MINUS 4 SCCS (MFSC SPEC -384A).
- (C) INSPECTION:
ALL PARTS ARE INSPECTED FOR WEIGHT, WORKMANSHIP, FINISH, DIMENSIONS, CLEANLINESS, MATERIALS AND PROCESSES. MATERIAL AND PROCESS CERTIFICATION ARE VERIFIED BY INSPECTION. ACCEPTANCE TEST PROCEDURES ARE APPROVED BY QUALITY ASSURANCE AND VERIFIED BY INSPECTION.
- (D) FAILURE HISTORY:
THERE IS NO REPORTED FAILURE HISTORY OF THIS ASSEMBLY IN THE PRACA SYSTEM.
- (E) OPERATIONAL USE:
N/A
- (E) FUNCTIONAL CRITICALITY EFFECTS: ~~FLIGHT ADAPTER ASSEMBLY~~
POSSIBLE LOSS OF CREW/VEHICLE DURING AN ORBITER ESO MISSION DUE TO THE FOLLOWING SCENARIO: 1) ~~FLEX HOSE~~ TRANSPORTING SAMPLE GASES FROM THE RCRS BED OUTLET AIRSTREAM FAILS - SAMPLE GASES CORRUPTED - ERRONEOUS CO2 MEASUREMENT BY THE CO2 ANALYZER, MASKING THE FAILURE OF THE RCRS BED(S) TO REMOVE CO2 FROM THE RCRS INLET AIRSTREAM, 2) DURING A MISSION, EXCESS CO2 ALARMS AND/OR THE LITHIUM DIOXIDE CARTRIDGES FAIL, RESULTING IN THE BUILDUP OF DISABLING LEVELS OF CO2 IN THE CABIN ATMOSPHERE - LOSS OF CREW/VEHICLE.

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- APPROVALS -

RELIABILITY MANAGER	:	M. P. RAGUSA	:	<i>M.P. Ragusa</i>
DESIGN MANAGER	:	D. R. CABLE	:	<i>D.R. Cable</i>
QUALITY MANAGER	:	O. J. BUTNER	:	<i>O.J. Butner 9/3/91</i>
NASA RELIABILITY	:		:	<i>Jr. Billings 1/27/92</i>
NASA SUBSYSTEM MANAGER	:		:	<i>A. Dumblett 7/10/92</i>
NASA QUALITY ASSURANCE	:		:	<i>[Signature]</i>