FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE
NUMBER: 06-3D-0506 -X

SUBSYSTEM NAME: ATCS - RADIATORS AND FLOW CONTROL
REVISION: 0 12/05/97

PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	¾" LINE W/VISCO JET ORIFICE	VDLA4336730H

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
ANTI HYDRAULIC LOCK ORIFICE (ORIFICE#1).

REFERENCE DESIGNATORS:

QUANTITY OF LIKE ITEMS: 2
ONE PER EACH COOLANT LOOP

FUNCTION:
PROVIDES PRESSURE RELIEF FOR FREON IN LINE BETWEEN RADIATOR FLOW CONTROL ASSEMBLY, CHECK VALVE, AND ISOLATION VALVE WHEN VALVE CONFIGURATIONS MAY CAUSE HYDRAULIC LOCKUP.

FAILURE MODES EFFECTS ANALYSIS FMEA – CIL FAILURE MODE
NUMBER: 06-3D-0506- 01

REVISION#: 0 12/02/97

SUBSYSTEM NAME: ATCS - RADIATORS AND FLOW CONTROL
LRU: ¾" LINE W VISCO JET ORIFICE
ITEM NAME: ¾ " LINE W VISCO JET ORIFICE
CRITICALITY OF THIS FAILURE MODE: 1R2

FAILURE MODE:
EXTERNAL LEAK

MISSION PHASE:
OO ON-ORBIT
DO DE-ORBIT

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

CAUSE:
VIBRATION, MECHANICAL SHOCK, CORROSION, CONTAMINATION.

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN
A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
FIRST FAILURE WILL CAUSE LOSS OF ONE FREON COOLANT LOOP AND PROBABLE LOSS OF MISSION..

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(B) INTERFACING SUBSYSTEM(S):
FIRST FAILURE WILL CAUSE POSSIBLE SHUTDOWN OF SOME EFFECTED SYSTEMS DUE TO REDUCED COOLING CAPACITY.

(C) MISSION:
PROBABLE LOSS OF MISSION AFTER FIRST FAILURE: EXTERNAL LEAK ORIFICE LINE.

(D) CREW, VEHICLE, AND ELEMENT(S):
POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND ASSOCIATED FAILURE: LOSS OF REDUNDANT SECOND COOLING LOOP.

(E) FUNCTIONAL CRITICALITY EFFECTS:
PROBABLE LOSS OF MISSION AFTER ONE FAILURE: EXTERNAL LEAK ORIFICE LINECAUSING LOSS OF COOLANT FOR EFFECTED LOOP.
POSSIBLE LOSS OF CREW/VEHICLE AFTER TWO FAILURES: (1) EXTERNAL LEAK ORIFICE LINE CAUSING LOSS OF COOLANT FOR EFFECTED LOOP AND (2) LOSS OF REDUNDANT COOLANT LOOP RESULTING IN TOTAL LOSS OF VEHICLE COOLING.

-DISPOSITION RATIONALE-

(A) DESIGN:
LINE MOUNT, 73000 LOHM RATE, 0.015" MIN PASSAGE SIZE, 0.01" SCREEN, 3000 PSI MAX OPERATING PRESSURE, ALL 304L CRES CONSTRUCTION MATERIAL, 41 G WEIGHT. SELECTED TO PROVIDE MINIMUM POSSIBLE FLOW WHILE MEETING PRESSURE RELIEF REQUIREMENT AND LARGE ENOUGH TO AVOID BEING CLOGGED BY CONTAMINATION. MINIMUM PASSAGE SIZE OF 381 MICRON (0.015") IS 5.9 TIMES LARGER THAN THE 65 MICRON LARGEST FILTER SIZE IN THE FCL, MINIMIZING THE PROBABILITY OF CLOGGING BY CONTAMINATION. THE COOLANT WILL FLOW THROUGH THE ORIFICE IN BOTH DIRECTIONS THUS PERMITTING SELF CLEANING.

(B) TEST:
GROUND TURNAROUND TEST

FREON COOLANT LOOPS ARE LEAK CHECKED PRIOR TO EACH FLIGHT.

(C) INSPECTION:
NONE.

(D) FAILURE HISTORY:
NO APPLICABLE FAILURE HISTORY.

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(E) OPERATIONAL USE:
ON-BOARD ALARMS, FREON INLET PRESSURE AND ACCUMULATOR QUANTITY, WILL PROVIDE INDICATION OF HARDWARE FAILURE. FREON PUMP WILL BE TURNED OFF AND LOSS OF ONE FREON LOOP POWERDOWN WILL BE PERFORMED. ENTRY AT NEXT PRIMARY LANDING SITE.

- APPROVALS -

SS & PAE MANAGER	for D.F. MIKULA	
SS & PAE ENGINEER	: K.E. RYAN	K E Ryan TLD
ECLSS-ATCS	: L. T. HARPER	
BNA SSM	: S. .N. NGUYEN	
JSC MOD	:	
JSC RDE		Nanette Cebra 11-24-98
USA/contractor		1-4-9
		11/18/98