

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE****NUMBER: 06-3E-0326 -X****SUBSYSTEM NAME:** ATCS - FLASH EVAPORATOR SYSTEM (FES)**REVISION:** 0 04/18/01

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**PART DATA**

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	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
ASSY	: FLASH EVAPORATOR ASSY HAMILTON STANDARD	MC250-0017
LRU	:NOZZLE DUCT, HIGH LOAD HAMILTON STANDARD	MC250-0017-0580 SV767380-4
LRU	:DUCT & HEATER, HI-LOAD HAMILTON STANDARD	MC250-0017-0501 SV767601-4
LRU	: ELBOW & HEATER, HI-LOAD HAMILTON STANDARD	MC250-0017-0581 SV767381-4

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

STEAM DUCT, HIGH LOAD EVAPORATOR.

**QUANTITY OF LIKE ITEMS:** 1

ONE; DUCT SECTIONS

**FUNCTION:**

TRANSFERS THE HIGH LOAD EVAPORATOR EXHAUST OVERBOARD. THE DUCT ASSEMBLY CONTAINS THREE HEATER CONTROL ASSEMBLIES.

**REFERENCE DOCUMENTS:** MC250-0017 - FLASH EVAPORATOR SUBSYSTEM SPEC

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

**NUMBER: 06-3E-0326- 02**

**REVISION#: 0 04/18/01**

**SUBSYSTEM NAME: ATCS - FLASH EVAPORATOR SYSTEM (FES)**

**LRU: HIGH LOAD DUCTS; NOZZLE, ELBOW, DUCT**

**CRITICALITY OF THIS**

**ITEM NAME: HIGH LOAD DUCT ASSEMBLY**

**FAILURE MODE: 1R3**

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**FUNCTIONAL CRITICALITY/**

**REQUIRED FAULT TOLERANCE/ACHIEVED FAULT TOLERANCE:1R/1/4**

**FAILURE MODE:**

OPEN (HEATER OR THERMOSTAT)

**MISSION PHASE:**

- LO LIFT-OFF
- OO ON-ORBIT
- DO DE-ORBIT

**VEHICLE/PAYLOAD/KIT EFFECTIVITY:**

- 102 COLUMBIA
- 103 DISCOVERY
- 104 ATLANTIS
- 105 ENDEAVOUR

**CAUSE:**

PIECE PART FAILURE, VIBRATION, MECHANICAL SHOCK

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

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**REDUNDANCY SCREEN**

- A) PASS
- B) PASS
- C) PASS

**PASS/FAIL RATIONALE:**

A)

B)

C)

**CORRECTING ACTION: MANUAL**

**CORRECTING ACTION DESCRIPTION:**

CREW CAN SWITCH TO REDUNDANT HEATER.

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**REMARKS/RECOMMENDATIONS:**

THE FLASH EVAPORATOR SYSTEM (FES) IS THE PRIMARY HEAT REJECTION FOR ORBITER DURING ASCENT FROM 140,000 FT TO PAYLOAD BAY DOOR (PLB) OPEN. AFTER PLB OPENS, RADIATORS WILL BE THE PRIME HEAT REJECTION DEVICE. FOR DE-ORBIT PREP AND DE-ORBIT, THE FES OPERATES FROM THE PLB CLOSURE UNTIL 100,000 FT. AFTER 100,000 FT, AMMONIA BOILER SUBSYSTEM (ABS) CAN BE USED FOR VEHICLE HEAT REJECTION. DURING ORBITAL OPERATION, THE FES CAN BE USED TO SUPPLEMENT THE RADIATORS DURING THE HIGH ORBITAL HEAT.

BOTH TOPPING AND HI-LOAD EVAPORATORS ARE ACTIVE DURING HIGH VEHICLE HEAT LOADS (DURING ASCENT/ENTRY). DURING ON-ORBIT OPERATION, THE TOPPING EVAPORATOR CAN BE ACTIVATED TO SUPPLEMENT RADIATORS FOR HEAT REJECTION.

THERE ARE THREE HEATER ELEMENTS ON ALL SEGMENTS OF THE HIGH LOAD DUCT/NOZZLE.

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**- FAILURE EFFECTS -**

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**(A) SUBSYSTEM:**

LOSS OF ASSOCIATED HEATER

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

NO EFFECT

**(C) MISSION:**

NO EFFECT

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

NO EFFECT.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF VEHICLE COOLING CAPABILITY AFTER FOUR ADDITIONAL FAILURES (LOSS OF REDUNDANT HEATER ELEMENTS RESULTING IN LOSS OF HIGH LOAD EVAPORATOR, AND ANY TWO ADDITIONAL FAILURES: TOPPING EVAPORATOR, RADIATOR, AND/OR AMMONIA BOILER SYSTEM)

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**- TIME FRAME -**

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**TIME FROM FAILURE TO CRITICAL EFFECT: MINUTES**

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**- APPROVALS -**

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S&R ENGINEER	: T. T. AI	: /S/ T. AI _____
DESIGN ENGINEER	: J. HILL	: /S/ J. HILL _____
SUBSYSTEM MANAGER	: S. NGUYEN	: /S/ S. NGUYEN _____