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PRINT DATE: 05/30/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: 05-6VE-2002-X

SUBSYSTEM NAME: EPD&C - ECLSS - WASTE WATER MANAGEMENT

REVISION : 2 05/30/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU :	PANEL ML31C	V570-733852
SRU :	SWITCH, TOGGLE	ME452-0102-7201

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
SWITCH, TOGGLE - WASTE WATER DUMP VALVE ENABLE/NOZZLE HEATER

REFERENCE DESIGNATORS: 80V73A127 SB

QUANTITY OF LIKE ITEMS: 1
ONE PER SYSTEM
ONE PER VEHICLE

FUNCTION:
PROVIDE CONTROL OF POWER TO THE WASTE WATER DUMP NOZZLE HEATERS AND
POWER TO THE WASTE WATER DUMP VALVE SWITCH.

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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6VE-2002-01

SUBSYSTEM: EPD&C - ECLSS - WASTE WATER MANAGEMENT	REVISION#	2 05/30/90 R
LRU :PANEL ML31C		
ITEM NAME: SWITCH, TOGGLE		CRITICALITY OF THIS FAILURE MODE:2/2

FAILURE MODE:
FAILS OPEN OR SHORT TO GROUND

MISSION PHASE:
00 ON-ORBIT

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

CAUSE:
PIECE PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY

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:
 WASTE WATER STOWAGE CAPABILITY - 2/2
 LOSS OF POWER TO THE WASTE WATER NOZZLE HEATERS AND DUMP VALVE SWITCH.

EFFECT(S) ON SUPPLY WATER CONTINGENCY DUMP CAPABILITY - 1R/3
 LOSS OF POWER TO WASTE WATER DUMP VALVE AND NOZZLE HEATER.

(B) INTERFACING SUBSYSTEM(S):
 WASTE WATER STOWAGE CAPABILITY - 2/2

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6VE-2002-01

LOSS OF CAPABILITY TO DUMP WATER THROUGH THE WASTE WATER DUMP VALVE AND NOZZLE.

EFFECT(S) ON SUPPLY WATER CONTINGENCY DUMP CAPABILITY - 1R/3
LOSS OF CAPABILITY TO DUMP WATER THROUGH THE WASTE WATER DUMP VALVE AND NOZZLE.

(C) MISSION:
WASTE WATER STOWAGE CAPABILITY - 2/2
MISSION DURATION IS LIMITED BECAUSE OF LOSS OF WASTE WATER DUMP CAPABILITY AND LOSS OF USE OF CONTINGENCY WATER CONTAINER IF THE VALVE IS IN THE OPEN POSITION WHEN THE TOGGLE SWITCH FAILS OPEN OR SHORTS TO GROUND CAUSING THE UPSTREAM CIRCUIT BREAKER TO TRIP.

EFFECT(S) ON SUPPLY WATER CONTINGENCY DUMP CAPABILITY - 1R/3
NO EFFECT - FIRST FAILURE.

(D) CREW, VEHICLE, AND ELEMENT(S):
WASTE WATER STOWAGE CAPABILITY - 2/2
NO EFFECT.

EFFECT(S) ON SUPPLY WATER CONTINGENCY DUMP CAPABILITY - 1R/3
NO EFFECT - FIRST FAILURE.

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE BASED UPON THE FOLLOWING SCENARIO:

- (1) FAILURE OF THE WASTE DUMP CAPABILITY (CB OPEN/DUMP VALVE OPEN OR CLOSED.)
- (2) LOSS OF SUPPLY WATER DUMP CAPABILITY
- (3) LOSS OF TOPPING EVAPORATOR DUMP CAPABILITY
- (4) LOSS OF VENTING THROUGH THE FUEL CELL WATER RELIEF VALVES

THESE FAILURES RESULT IN THE LOSS OF ELECTRICAL POWER DUE TO FUEL CELL FLOODING.

- DISPOSITION RATIONALE -

(A) DESIGN:
REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

- (B) TEST:
REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

VALVE OPERATION VERIFIED IN FLIGHT EVERY FLOW.

