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PRINT DATE: 10/19/88

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-2E-0438-X

SUBSYSTEM NAME: LIFE SUPPORT

REVISION : 10/19/88

CLASSIFICATION NAME PART NUMBER
LRU : LINES, FITTINGS, DISCONNECTS V070-623002

QUANTITY OF LIKE ITEMS: 1
ONE PER SUBSYSTEM

DESCRIPTION/FUNCTION:

LINES, FITTINGS, AND QUICK DISCONNECTS (QD'S) FROM THE WASTE WATER DUMP ISOLATION VALVE TO THE WASTE WATER DUMP VALVE AND TO THE CROSS-TIE QD

PROVIDES WASTE WATER FLOW PATH FROM THE WASTE WATER STORAGE TANK TO THE DUMP NOZZLE AND TO THE CROSS-TIE QD.

06-2E-35

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-2E-0438-I

SUMMARY

SUBSYSTEM NAME: LIFE SUPPORT
 LRU : LINES, FITTINGS, DISCONNECTS
 LRU PART #: V070-623002
 ITEM NAME: LINES, FITTINGS, DISCONNECTS

FMEA NUMBER	ABBREVIATED FAILURE MODE DESCRIPTION	CIL FLG	CRIT	H2D FLG
06-2E-0438-01	FLOW OR THRUST ANOMALIES	X	2 2	
06-2E-0438-02	EXTERNAL LEAKAGE	X	2 2	

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SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-2E-0438-02

SUBSYSTEM: LIFE SUPPORT
LRU : LINES, FITTINGS, DISCONNECTS
ITEM NAME: LINES, FITTINGS, DISCONNECTS

REVISION: 10/19/88

CRITICALITY OF THIS
FAILURE MODE: 2 2

FAILURE MODE:
EXTERNAL LEAKAGE

MISSION PHASE:
LO LIFT-OFF
OO ON-ORBIT

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

CAUSE:
VIBRATION, CORROSION, MECHANICAL SHOCK, VIBRATION

CRITICALITY 1/1 DURING ANY MISSION PHASE OR ABORT? N

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

PASS/FAIL RATIONALE:

A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
INABILITY TO DUMP WASTE WATER. POSSIBLE LOSS OF CONTINGENCY SUPPLY
WATER CROSS-TIE CAPABILITY.

(B) INTERFACING SUBSYSTEM(S):
SAME AS (A)

(C) MISSION:
LOSS OF WASTE WATER STORAGE CAPACITY WILL LIMIT MISSION DURATION.
(CRITICALITY 2/2)

06-2E-40

SEATTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-2E-0438-02

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT.

RATIONALE FOR CRITICALITY:

FUNCTIONAL CRITICALITY EFFECT - LOSS OF ALL SUPPLY WATER DUMP CAPABILITY (SUPPLY WATER DUMP LINE, WASTE WATER DUMP LINE, FLASH EVAPORATOR DUMP MODE, AND FUEL CELL OVERBOARD DUMP NOZZLE) CAN DEAD HEAD THE FUEL CELL WATER OUTPUT LINE AND CAUSE LOSS OF CREW/VEHICLE. (CRITICALITY 1R3 PPP EFFECT)

- DISPOSITION RATIONALE -

(A) DESIGN:

CORROSION-RESISTANT MATERIALS - TUBING (21-6-9 CRES), DYNATUBE FITTINGS (17-4 PH), INSTALLATION INSTRUCTIONS PER V070-623002 (TORQUING, INSULATION, INSTALLATION, ETC.). FITTINGS AND JOINTS ARE BRAZED. TUBING SUPPORTS PER MA0102-306. QD IS ALL STAINLESS STEEL CONSTRUCTION WITH AN ETHYLENE PROPYLENE (EPR) O-RING SEAL AND A TEFLON BACKUP RING SEAL. ALL MATERIALS ARE COMPATIBLE WITH WORKING FLUIDS (URINE, EMU DRAIN WATER, AND DISINFECTANT). SAFETY FACTOR GREATER THAN FOUR.

(B) TEST:

CERTIFICATION FOR 100 MISSION LIFE. VIBRATION, FATIGUE, BURST, AND SHOCK ARE BASED ON REPRESENTATIVE PANEL TEST FOR ECLSS, ELECTRICAL POWER GENERATOR AND HYDRAULICS OF TYPICAL PLUMBING INSTALLATION CONDUCTED AT HIGHER LEVELS THAN THAT REQUIRED FOR ECLSS PLUMBING. PROOF TEST - 2 TIMES MAXIMUM OPERATING PRESSURE. IMPULSE FATIGUE TEST - 2 X 10 (EXP +5) CYCLES OF IMPULSE WAVES. LEAK TEST - OVERPRESSURE AND LEAK ARE PERFORMED AFTER INSTALLATION. QMRSD: SYSTEM IS VERIFIED FOR NO LEAKAGE PRIOR TO EACH FLIGHT.

(C) INSPECTION:

RECEIVING INSPECTION
RAW MATERIALS AND PROCESSES ARE VERIFIED.

CONTAMINATION CONTROL

CORROSION PROTECTION PROVISIONS AND CONTAMINATION CONTROL PLAN ARE VERIFIED BY INSPECTION. CLEANLINESS OF PARTS AND TOOLS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

QD IS VISUALLY INSPECTED FOR DAMAGE DURING INSTALLATION. DIMENSIONS AND TORQUING ARE VERIFIED BY INSPECTION. MANUFACTURING PROCESSES, INSTALLATION AND ASSEMBLY ARE VERIFIED BY INSPECTION. FABRICATED DETAILS CONFIGURATION IS VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-2E-0438-02

JOINT/TUBE BRAZING IS VERIFIED BY RADIOGRAPHIC INSPECTION.

CRITICAL PROCESSES

BRAZING PROCESS IS VERIFIED BY INSPECTION. WELDING CERTIFICATION AND HEAT TREATMENT OF QD ARE VERIFIED BY INSPECTION.

TESTING

PROOF PRESSURE TEST AND LEAK TEST ARE VERIFIED BY INSPECTION.

HANDLING/PACKAGING

PARTS PROTECTION IS VERIFIED BY INSPECTION.

(D) FAILURE HISTORY:

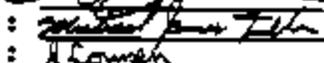
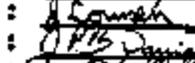
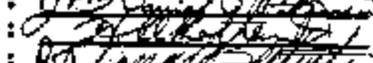
NO FAILURES.

(E) OPERATIONAL USE:

CREW WOULD RETURN TO THE PRIMARY LANDING SITE BEFORE THE WASTE TANK BECOMES HARD FILLED (PER FLIGHT RULE).

REMARKS:

- APPROVALS -

RELIABILITY ENGINEERING:	L. SCHASCHL	o c c	
DESIGN ENGINEERING	: S. CASTILLO	o c	: 
QUALITY ENGINEERING	: M. SAVALA	M.S	: 
NASA RELIABILITY	:		: 
NASA DESIGN	:		: 
NASA QUALITY ASSURANCE	:		: 