

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : LIFE SUPPORT FMEA NO 06-2E -0435 -2 REV:12/08,  
 ASSEMBLY : VENT AND DUMP EQUIPMENT CRIT. FUNC:  
 P/N RI : V070-623002 CRIT. HDW:  
 P/N VENDOR: VEHICLE 102 103 104  
 QUANTITY : 1 EFFECTIVITY: X X X  
 : PHASE(S): PL LO OO X DO LS  
 : ONE PER SUBSYSTEM

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 APPROVED BY: REDUNDANCY SCREEN A- B- C-  
 APPROVED BY (NASA): SSM REL QE

ITEM:

LINES, FITTINGS, AND QUICK DISCONNECTS (QD'S) FROM THE WCS/WASTE TANK INTERFACE QD TO THE WASTE TANK INLET VALVE, THE FILL QD, AND THE ATMOSPHERIC REVITALIZATION SYSTEM (ARS) HUMIDITY SEPARATOR INTERFACE.

FUNCTION:

PROVIDES FLOW PATH FOR WASTE WATER FROM THE WCS INTERFACE QD AND ARS HUMIDITY SEPARATORS TO THE WASTE WATER TANK; INCLUDES FLOW PATH TO THE FILL QD FOR GSE SERVICING.

FAILURE MODE:

EXTERNAL LEAKAGE

CAUSE(S):

VIBRATION, CORROSION, MECHANICAL SHOCK

EFFECT(S) ON:

(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE

(A, B) LOSS OF WASTE WATER COLLECTION FROM THE WCS AND HUMIDITY SEPARATORS. FREE WASTE WATER IN LOWER ECLSS BAY AND CABIN.

(C) LOSS OF WASTE WATER COLLECTION CAPABILITY MAY RESULT IN EARLY MISSION TERMINATION.

(D) NO EFFECT.

DISPOSITION & RATIONALE:

(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(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 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.

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(B) TEST

CERTIFICATION FOR 100 MISSION LIFE. VIBRATION, FATIGUE, BURST, AND SHOCK ARE BASED ON REPRESENTATIVE PANEL TEST FOR ECLSS, ELECTRICAL PC 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.

OMRSD: 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 & TORQUING ARE VERIFIED BY INSPECTION. MANUFACTURING PROCESSES, INSTALLATION AND ASSEMBLY ARE VERIFIED BY INSPECTION. FABRICATED DETAILS CONFIGURATION IS VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION

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 PERFORM THE WASTE WATER LEAK ISOLATION PROCEDURE.