

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : LIFE SUPPORT FMEA NO 06-2E -0437 -2 REV:12/08,
 ASSEMBLY : VENT AND DUMP EQUIPMENT CRIT. FUNC:
 P/N RI : VC70-623002 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

REDUNDANCY SCREEN: A-PASS B-FAIL C-PA
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES S. CASTILLO DES *[Signature]* SSM *[Signature]* 12/10
 REL L. SCHASCHL REL *[Signature]* REL *[Signature]*
 QE M. SAVALA QE *[Signature]* QE *[Signature]*

ITEM:

LINES, FITTINGS, AND QUICK DISCONNECT (QD)
 FROM THE WASTE WATER TANK OUTLET VALVE TO THE DRAIN QD

FUNCTION:

PROVIDES FLOW PATH FOR GSE DRAINING AND SERVICING OF WASTE WATER TANK

FAILURE MODE:

EXTERNAL LEAKAGE

CAUSE(S):

VIBRATION, CORROSION, MECHANICAL SHOCK

EFFECT(S) ON:

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

(A, B, C, D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - AFTER SECOND FAILURE (LEAKAGE
 OF WASTE TANK OUTLET VALVE), THE STORED WASTE WATER WILL LEAK INTO LC
 ECLSS BAY. LOSS OF ALL WASTE WATER STORAGE CAPABILITY MAY LIMIT MISSION
 DURATION.

REDUNDANCY SCREEN B FAILS BECAUSE FIRST FAILURE IS NOT DETECTABLE
 UNTIL SECOND FAILURE OCCURS.

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. TUBE
 SUPPORTS PER MA0102-306. QD IS ALL STAINLESS STEEL CONSTRUCTION WITH
 ETHYLENE PROPYLENE (EPR) O-RING SEAL AND A TEFLON BACKUP RING SEAL.
 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 PC
 GENERATOR AND HYDRAULICS OF TYPICAL PLUMBING INSTALLATION CONDUCTED P

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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

NO CREW ACTION REQUIRED.