

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : LIFE SUPPORT FMEA NO 06-2E 0431 -1 REV:10/29/
 ASSEMBLY : WASTE WATER STORAGE CRIT. FUNC:
 P/N RI : MC276-0020-1101 CRIT. HDW:
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 1 EFFECTIVITY: X X X
 : PHASE(S): PL LO X OO X DO X LS
 : ONE PER SUBSYSTEM

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

ITEM:
 QUICK DISCONNECT (QD) AND CAP, WASTE WATER CROSS-TIE

FUNCTION:
 PROVIDES THE CAPABILITY FOR CROSS DUMPING SUPPLY OR WASTE WATER AND F
 DIRECT OVERBOARD DISPOSING OF LIQUID SPILLS.

FAILURE MODE:
 EXTERNAL LEAKAGE

CAUSE(S):
 VIBRATION, CORROSION, MECHANICAL SHOCK

EFFECT(S) ON:
 (A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE
 (A, B) INABILITY TO DUMP WASTE WATER. LOSS OF CONTINGENCY SUPPLY
 WATER CROSS-TIE CAPABILITY. POSSIBLE FREE WASTE WATER IN CABIN.
 (C) LOSS OF WASTE WATER STORAGE CAPACITY MAY LIMIT MISSION DURATION.
 (D) NO EFFECT.
 (E) 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 H
 THE FUEL CELL WATER OUTPUT LINE AND CAUSE LOSS OF CREW/VEHICLE.

DISPOSITION & RATIONALE:
 (A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A) DESIGN
 QD IS ALL STAINLESS STEEL CONSTRUCTION WITH AN ETHYLENE PROPYLENE (EP
 O-RING SEAL AND A TEFLON BACKUP RING SEAL. CAP IS STAINLESS STEEL WI
 EPR O-RING SEAL. CAP IS INSTALLED BEFORE FLIGHT AND PROVIDES REDUNDA
 SEAL TO QD POPPET. POPPET IS SPRING-LOADED CLOSED.

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(B) TEST

QUALIFICATION TESTS FOR 100 MISSION LIFE INCLUDE: SHOCK TESTED AT 20 G PER AXIS, OPERATION TEST OF 5 CYCLES AT 0 PSIG AND AT 55 PSIG, BURST TESTED AT 180 PSIG FOR 5 MINUTES (MAXIMUM OPERATING PRESSURE OF 22 PSIG), RANDOM VIBRATION - 0.2G SQ/HZ AT 10 PSIG FOR FIRST 24 MINUTES/AXIS FOLLOWED AT 90 PSIG FOR 24 MINUTES/AXIS, 5% SALT/85% RH FC 50 HOURS, THERMAL TEST AT 250 F FOR 15 MINUTES AND AT -65 F FOR 3 HRS.

ACCEPTANCE TESTS - LEAKAGE AND PROOF PRESSURE - PRESSURIZED AT 10, 55 AND 90 PSIG IN THE MATED, DEMATED, AND CAPPED CONFIGURATIONS. LEAKAGE WILL NOT EXCEED 0.0001 SCCS He. CAP LEAK TESTED WHILE MATED WITH TOOLS OF MAXIMUM AND MINIMUM DIMENSIONS TO ASSURE A PROPER FIT TO ALL QD'S.

OMRSD: LEAK CHECK PRIOR TO EACH FLIGHT.

(C) INSPECTION

RECEIVING INSPECTION

CERTIFICATION OF RAW MATERIALS AND PROCESSES IS VERIFIED.

CONTAMINATION CONTROL

CONTAMINATION CONTROL PLAN AND CORROSION PROTECTION PROVISIONS ARE VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

VISUAL INSPECTION FOR DAMAGE DURING INSTALLATION AND ASSEMBLY IS VERIFIED BY INSPECTION. DIMENSIONS ARE VERIFIED BY INSPECTION.

CRITICAL PROCESSES

WELDING CERTIFICATION AND HEAT TREATMENT ARE VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION

WELD X-RAYS ARE VERIFIED BY INSPECTION.

TESTING

ACCEPTANCE TEST PROCEDURE IS VERIFIED BY INSPECTION.

HANDLING/PACKAGING

PARTS PROTECTION, HANDLING AND PACKAGING REQUIREMENTS ARE VERIFIED.

(D) FAILURE HISTORY

NO FAILURES.

(E) OPERATIONAL USE

CREW WOULD ISOLATE WASTE WATER LEAK BY CLOSING DUMP ISOLATION VALVE. THE CREW WOULD RETURN TO THE PRIMARY LANDING SITE BEFORE THE WASTE TANK BECOMES HARD FILLED (PER FLIGHT RULE).