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PRINT DATE: 10/20/88

FAILURE MODES EFFECTS ANALYSIS (FMEA) NUMBER: 06-2D-1152-I

SUBSYSTEM NAME: LIFE SUPPORT

REVISION : 10/20/88

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CLASSIFICATION                      NAME                      PART NUMBER  
LRU                      :              LNS, FTS, HOSE, QD&COMP              V070-623200

QUANTITY OF LIKE ITEMS: 1  
ONE PER SUBSYSTEM

DESCRIPTION/FUNCTION:

LINES, FITTINGS, AND QUICK DISCONNECT (QD), 4-WAY CROSS-FITTING TO FILL QD.

PROVIDES A PATHWAY FOR THE MOVEMENT OF SUPPLY WATER FROM THE GSE EQUIPMENT DURING INITIAL FILLING OR TURNAROUND SERVICING AND DRAINING TO VARIOUS TANKS AND COMPONENTS IN THE SUPPLY WATER SYSTEM. THE PATHWAY EXTENDS FROM THE FILL QD TO THE 4-WAY FITTING PRIOR TO THE MICROBIAL CHECK VALVE. THESE LINES, FITTINGS, AND QD ARE NOT USED IN FLIGHT.

06-2D-22

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-2D-1162-X

SUMMARY

SUBSYSTEM NAME: LIFE SUPPORT  
LRU : LNS, FTS, HOSE, QD&COMP  
LRU PART #: V070-623200  
ITEM NAME: LNS, FTS, HOSE, QD&COMP

FMEA NUMBER	ABBREVIATED FAILURE MODE DESCRIPTION	CIL FLG	CRIT	H2D FLG
06-2D-1162-02	EXTERNAL LEAKAGE	X	2 2	

06-2D-23

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SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-2D-1162-02

REVISION: 10/20/88

SUBSYSTEM: LIFE SUPPORT  
LRU : LNS, PTS, HOSE, QD&COMP  
ITEM NAME: LNS, PTS, HOSE, QD&COMP

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:  
CORROSION, VIBRATION, MECHANICAL SHOCK

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:  
UNISOLATABLE LEAK OF FUEL CELL WATER INTO CABIN.

(B) INTERFACING SUBSYSTEM(S):  
UNISOLATABLE LEAK OF FUEL CELL WATER INTO CABIN.

(C) MISSION:  
UNISOLATABLE WATER LEAK MAY REQUIRE EARLY MISSION TERMINATION AND  
REQUIRES DEACTIVATION OF FES ON ORBIT RESULTING IN LOSS OF PAYLOAD  
COOLING AND MISSION OBJECTIVES.

06-2D-24

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-2D-1162-02

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

RATIONALE FOR CRITICALITY:

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- DISPOSITION RATIONALE -  
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(A) DESIGN:

CORROSION RESISTANT MATERIALS - TUBING (21-6-9 CRES), DYNATUBE FITTINGS (17-4 PH). INSTALLATION INSTRUCTIONS PER V070-623200 (TORQUING, INSULATION INSTALLATION, ETC.) PHENOLIC BRACKETS AND TEFLON TUBE CLAMPS FOR TUBE SUPPORT. CONNECTIONS AND JOINTS ARE BRAZED WITH A COPPER NICKEL GOLD ALLOY PREFORM. QD IS ALL STAINLESS STEEL CONSTRUCTION WITH AN ETHYLENE PROPYLENE O-RING SEAL AND A TEFLON BACKUP RING SEAL.

(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 - 1 X 10 (EXP -4) SCCS He MAXIMUM. IN-VEHICLE TEST - OVERPRESSURE AND LEAK ARE PERFORMED AFTER INSTALLATION. QMRSD: NO LEAKAGE IS VERIFIED BEFORE EACH FLIGHT.

(C) INSPECTION:

RECEIVING INSPECTION  
RAW MATERIAL CERTIFICATION IS VERIFIED BY INSPECTION.

CONTAMINATION CONTROL

CORROSION PROTECTION AND CLEANLINESS ARE VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

TORQUE IS VERIFIED FOR ALL DETAIL PARTS AND FLUID FITTING INSTALLATIONS.

NONDESTRUCTIVE EVALUATION

JOINT/TUBE BRAZING VERIFIED BY RADIOGRAPHIC INSPECTION.

TESTING

ACCEPTANCE TEST IS VERIFIED BY INSPECTION.

(D) FAILURE HISTORY:







NO FAILURES

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 06-2D-1162-02

(E) OPERATIONAL USE:  
CREW WOULD DEMATE MICROBIAL CHECK VALVE QD TO ISOLATE TANK A FOR WATER SUPPLY TO THE GALLEY.

REMARKS:

- APPROVALS -

RELIABILITY ENGINEERING:	D. R. RISING	DER	:	
DESIGN ENGINEERING	: S. CASTILLO	AC	:	
QUALITY ENGINEERING	: M. SAVALA	MS	:	
NASA RELIABILITY	:		:	
NASA DESIGN	:		:	
NASA QUALITY ASSURANCE	:		:	

11/5/88