

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ELECTRICAL POWER (FCP) FMEA NO 04-LA -0136 -2 REV:04/07/88

ASSEMBLY :									
P/N RI :	V070-454110-124					CRIT. FUNC:	LR		
P/N VENDOR:						CRIT. HDW:	2		
QUANTITY :	1	VEHICLE	102				103	104	
:ONE		EFFECTIVITY:	X				X	X	
:		PHASE(S):	PL	LO	X	OO	X	DC	X
:									LS

PREPARED BY:	J F WILLIAMS	DES	4-5-88	SSM		REDUNDANCY SCREEN:	A-PASS	B-PASS	C-PASS
DES	M E CORDERO	REL				APPROVED BY (NASA):			
REL	J T COURSEND	QE							
QE									

ITEM: PRIMARY PRODUCT WATER SUPPLY
LINE TO ECLSS.

FUNCTION:
SUPPLIES PRODUCT WATER FROM WATER RELIEF PANEL TO ECLSS.

FAILURE MODE: LEAKAGE
EXTERNAL.

CAUSE(S):
MECHANICAL SHOCK, VIBRATION, CORROSION.

EFFECT(S) ON:
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE

- (A) NO EFFECT ON FUEL CELL PERFORMANCE. POSSIBLE LOSS OF PRIMARY WATER SUPPLY LINE FLOW PATH IF EXTERNAL LEAKAGE RESULTS IN ICE BLOCKAGE IN WHICH CASE FUEL CELL PRODUCT WATER WILL BE AUTOMATICALLY DIVERTED TO ECLSS THROUGH THE ALTERNATE PRODUCT WATER SUPPLY LINE.
- (B) FUEL CELL PRODUCT WATER NO LONGER DELIVERED TO ECLSS THROUGH THE H2 SEPARATORS IF PRIMARY FLOW PATH BLOCKED.
- (C) ENTER NEXT DAILY PLANNED LANDING SITE IF LEAKAGE CAUSES FREEZING AND BLOCKAGE OF PRIMARY WATER SUPPLY LINE. THIS FAILURE MODE CANNOT BE DISTINGUISHED FROM EXTERNAL LEAKAGE OF WATER CAUSING A FROZEN WATER RELIEF PANEL (REF. CIL 04-LA-0137-1).
- (D) NO EFFECT AFTER FIRST FAILURE. LOSS OF ALL ABILITY TO RELIEVE FUEL CELL WATER WILL RESULT IN LOSS OF CREW/VEHICLE.

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

(A) DESIGN
STAINLESS STEEL IS USED IN THE CONSTRUCTION OF LINES AND FITTINGS FOR CORROSION RESISTANCE. BRAZED JOINTS OR HIGH STRENGTH MECHANICAL FITTINGS ARE USED THROUGHOUT FOR FLUID CONNECTIONS.

OPERATION AT LOW PRESSURE (51 PSIA MAX) MINIMIZES STRESS ON LINES AND

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FITTINGS CAPABLE OF WORKING AT SEVERAL THOUSAND PSI. COMPONENTS ARE DESIGNED WITH A MINIMUM BURST PRESSURE SAFETY FACTOR OF TWO AND ARE DESIGNED TO OPERATE IN THE VIBRATION, SHOCK, AND THERMAL ENVIRONMENTS ASSOCIATED WITH THIS APPLICATION.

FLUID LINES ARE ENCASED IN INSULATION AND COMPONENTS AND LINES ARE WRAPPED WITH REDUNDANT HEATERS TO MAINTAIN PROPER THERMAL CONTROL FOR THE DESIGN ENVIRONMENT.

(B) TEST

PROOF AND LEAKAGE TESTS PER MLO724-4540 AFTER LINE INSTALLATION. FINAL LEAKAGE TEST PER MLO720-4500 AFTER COMPONENT INSTALLATION. QUALIFICATION VIBRATION TESTING OF WATER RELIEF PANEL AND WATER LINES.

OMRSD: WATER SYSTEM INTEGRITY IS VERIFIED DURING EVERY GROUND TURNAROUND FOR WATER FLOW CAPABILITY AND EXTERNAL LEAKAGE.

(C) INSPECTION

RECEIVING INSPECTION

SUPPLIER HARDWARE IS INSPECTED IN ACCORDANCE WITH QUALITY PLANNING REQUIREMENTS DOCUMENT, WHICH WAS APPROVED BY NASA. TEST REPORTS AND RECORDS ARE MAINTAINED CERTIFYING MATERIALS AND PHYSICAL PROPERTIES.

CONTAMINATION CONTROL

PART CLEANED AND PASSIVATED PER APPLICABLE SPECIFICATION, AND VERIFIED BY INSPECTION. CLEANED TO LEVEL 300A OF THE CLEANLINESS SPECIFICATION FOR ALL INTERNAL SURFACES, AND GENERAL CLEANLINESS FOR EXTERNAL SURFACES IS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

FABRICATION OF TUBE IS PER DRAWING AND APPLICABLE SPECIFICATION, AND IS VERIFIED BY INSPECTION. ELECTROPOLISH REQUIRED AREAS PER DRAWING AND APPLICABLE SPECIFICATION AND VERIFIED BY INSPECTION. INSULATION IS EXAMINED BY INSPECTION FOR DAMAGE. TUBE MATERIAL IS VERIFIED BY INSPECTION ON MANUFACTURING ORDERS. INDUCTION BRAZING OF COMPONENTS IS PER SPECIFICATION AND DRAWING REQUIREMENTS, INCLUDING VISUAL AND X-RAY INSPECTION, TO DETERMINE ACCEPTABLE CRITERIA.

TESTING

LEAK TESTED PER APPLICABLE SPECIFICATION AND VERIFIED BY INSPECTION.

(D) FAILURE HISTORY

THERE HAVE BEEN NO ACCEPTANCE TEST, QUALIFICATION TEST, FIELD OR FLIGHT FAILURES ASSOCIATED WITH THIS FAILURE MODE.

(E) OPERATIONAL USE

NO CREW ACTION AFTER FIRST FAILURE.