

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ELECTRICAL POWER (FCP) FMEA NO 04-1A -0136 -1 REV:04/07/88

ASSEMBLY :
P/N RI : V070-454110-124
P/N VENDOR:
QUANTITY : 1
: ONE
:

	VEHICLE	102	103	104
EFFECTIVITY:		X	X	X
PHASE(S):	PL	LO X	OO X	DO X LS

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
PREPARED BY: APPROVED BY: APPROVED BY (NASA):
DES J F WILLIAMS DES *J.F. Williams* 4-8-88 SSK *John SSK*
REL M E CORDERO 7-REL *M.E. Cordero* REL *M.E. Cordero*
QE J T COURSEND 7-REL *J.T. Coursend* QE *J.T. Coursend*

ITEM: PRIMARY PRODUCT WATER SUPPLY
LINE TO ECLSS.

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

FAILURE MODE: PLUGGED
PARTIALLY OR FULLY, DUE TO CONTAMINATION AND/OR BY FREEZING CLOSED.

CAUSE(S):
CONTAMINATION, INSULATION DAMAGE.

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

- (A) NO EFFECT ON FUEL CELL PERFORMANCE IF PRODUCT WATER FLOW IS POSSIBLE THROUGH THE ALTERNATE PRODUCT WATER SUPPLY LINE OR THROUGH THE EMERGENCY WATER RELIEF SYSTEM.
- (B) FUEL CELL PRODUCT WATER IS NO LONGER DELIVERED TO ECLSS THROUGH THE H2 SEPARATORS.
- (C) ENTER NEXT DAILY PLANNED LANDING SITE SINCE THIS FAILURE MODE CANNOT BE DISTINGUISHED FROM EXTERNAL LEAKAGE OF WATER CAUSING A FROZEN WATER RELIEF PANEL (REF. CIL 04-1A-0117-1).
- (D) NO EFFECT ON CREW/VEHICLE IF ALTERNATE PRODUCT WATER SUPPLY LINE OR EMERGENCY WATER RELIEF SYSTEM FUNCTIONS. CREW/VEHICLE WILL BE LOST IF THE ALTERNATE PRODUCT WATER SUPPLY LINE AND EMERGENCY RELIEF SYSTEM FAIL TO FUNCTION.

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

- (A) DESIGN
STAINLESS STEEL TUBING 1/4 INCH OUTSIDE DIAMETER FOR CORROSION RESISTANCE. 1/2 INCH THICK TG 15000 LINE INSULATION PROTECTS WATER LINE FROM FREEZING. INSULATION IS COVERED WITH POLYESTER FILM AND POLYIMIDE TAPE OR CRES FOIL TO PROTECT AGAINST INSULATION DAMAGE.

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CONTINUOUS FLOW OF WATER IN LINE, AT MINIMUM FLOW RATES PREDICTED, PRECLUDES WATER FREEZING EVEN IF INSULATION IS LOCALLY DAMAGED. LINES ARE WRAPPED WITH ELECTRICAL HEATERS TO PREVENT FREEZING OF STAGNANT WATER IF FLOW IS TEMPORARILY DIVERTED TO ALTERNATE WATER FLOW PATH.

ALTERNATE WATER FLOW PATH ADDED TO DIRECT WATER TO STORAGE TANKS IF PRIMARY LINE BECOMES BLOCKED.

(B) TEST

FLOW THROUGH TEST PER MLO724-4541. QUALIFICATION VIBRATION AND THERMAL VACUUM TESTING PERFORMED TO VERIFY STRUCTURAL INTEGRITY AND THERMAL DESIGN.

OMRSD: FLOW THROUGH IS VERIFIED PRELAUNCH AND DURING FLIGHT OPERATIONS WATER SYSTEM INTEGRITY IS VERIFIED DURING GROUND TURNAROUND EVERY FLIGHT.

(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.