

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ELECTRICAL POWER (FCP) FMEA NO 04-1A -0153 -2 REV:04/07/88

ASSEMBLY :
 P/N RI : V070-454110-148
 P/N VENDOR:
 QUANTITY : 1
 : ONE
 :
 VEHICLE 102 103 104
 EFFECTIVITY: X X X
 PHASE(S): PL LO X OO X DO X LS

PREPARED BY: DES J F WILLIAMS REL M E CORDERO QE J T COURSEND
 APPROVED BY: DES J. F. Williams 4-8-88 REL [Signature] QE [Signature]
 REDUNDANCY SCREEN: A-PASS B-N/A C-PASS
 APPROVED BY (NASA): SSM [Signature] REL [Signature] QE [Signature]

ITEM: ALTERNATE PRODUCT WATER SUPPLY
 LINE TO ECLSS.

FUNCTION:
 SUPPLIES PRODUCT WATER FROM FUEL CELLS TO ECLSS IF PRIMARY PATH LOST.

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

USE(S):
 CONTAMINATION, INSULATION DAMAGE, HEATER FAILURE.

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 PRIMARY ECLSS LINE OR EMERGENCY WATER RELIEF SYSTEM. IF EMERGENCY WATER RELIEF PANEL ASSY IS PLUGGED (REF. CIL 04-1A-0137-1), FUEL CELLS WILL BE LOST DUE TO FLOODING.
- (B) INSUFFICIENT WATER SUPPLY TO ECLSS MAY DEVELOP IF ECLSS LINE IS BLOCKED (REF. CIL'S 04-1A-0136-1, 2). IF EMERGENCY WATER RELIEF PANEL ASSEMBLY IS PLUGGED, THE FUEL CELLS WILL BE LOST DUE TO FLOODING.
- (C) ABORT DECISION.
- (D) NO EFFECT ON CREW OR VEHICLE IF PRIMARY ECLSS LINE AND/OR EMERGENCY WATER RELIEF SYSTEM FUNCTIONS. OTHERWISE, CREW AND VEHICLE ARE LOST.

REDUNDANCY SCREEN B - SCREEN IS N/A AS ALTERNATE PRODUCT WATER SUPPLY LINE IS BACKUP TO THE PRIMARY PRODUCT WATER SUPPLY LINE.

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 COMPONENTS. HALF INCH THICK TG 15000 INSULATION PROTECTS WATER LINES FROM FREEZING. INSULATION IS COVERED WITH POLYESTER FILM AND POLYIMIDE TAPE OR CRES FOIL TO PROTECT AGAINST INSULATION DAMAGE.

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MINIMUM LINE INTERNAL DIAMETER OF 0.218 INCH MINIMIZES POTENTIAL FOR CONTAMINATION BLOCKAGE.

LINES ARE WRAPPED WITH REDUNDANT ELECTRICAL HEATERS TO PREVENT FREEZING. PRIMARY SYSTEM PROVIDES NORMAL WATER FLOW PATH.

(B) TEST

INSTALLATION CHECKOUT PER ML0503-0002.

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

(C) INSPECTION

RECEIVING INSPECTION

SUPPLIER HARDWARE IS INSPECTED IN ACCORDANCE WITH QUALITY PLANNING REQUIREMENTS DOCUMENT, WHICH WAS APPROVED BY NASA. TUBE MATERIAL IS VERIFIED BY INSPECTION ON MANUFACTURING ORDERS.

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. INDUCTION BRAZING OF COMPONENTS IS APPLICABLE SPECIFICATION AND DRAWING REQUIREMENTS, INCLUDING VISUAL AND X-RAY INSPECTION.

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.