

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - COMM. & TRACK. FMEA NO 05-6PR-51050 -1 REV:06/28/88

ASSEMBLY : PNL R15 CRIT. FUNC: 1R  
 P/N RI : MC454-0026-2150 CRIT. HDW: 2  
 P/N VENDOR: VEHICLE 102 103 104  
 QUANTITY : 1 EFFECTIVITY: X X X  
 : ONE PHASE(S): PL LO OO X DO LS  
 :

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS  
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):  
 DES H D HADDAD DES *[Signature]* 8/27/88 W/SSM MB *[Signature]* 9/8/88  
 REL *[Signature]* 7-5-88 J Y HARADA REL *[Signature]* 9/9/88  
 QE *[Signature]* 2-3-88 QE *[Signature]* 9/8/88  
 EPOC REL *[Signature]* 9/8/88  
 CAT 55M *[Signature]* 7/9/88

ITEM:  
 CB23, CIRCUIT BREAKER, 15 AMPS. KU-BAND EA-2 POWER AND DA/EA-1 OPERATE COMMAND.

FUNCTION:  
 CLOSSES AND OPENS THE POWER CIRCUITS TO THE KU-BAND ELECTRONIC ASSEMBLY 2; ENERGIZES RELAY K2, WHICH PROVIDES POWER TO DA, THROUGH CONTACT CLOSURE; ACTIVATES RPC53 WHICH PROVIDES POWER TO EA-1 THROUGH MNC. RECEIVES POWER FROM 35 AMP FUSE 40V76A32F18. (FMEA # 05-6-2278). 32V73A15CB23.

FAILURE MODE:  
 FAILS OPEN, FAILS TO CONDUCT, FAILS TO CLOSE

CAUSE(S):  
 STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS.

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

EFFECTS ON ABILITY TO CONTROL, POSITION, OR LOCK ANTENNA GIMBALS - 1R/2  
 (A) NO EFFECT ON EPDC.  
 (B) LOSS OF ABILITY TO LOCK GIMBALS, REAL-TIME DECISION REQUIRED TO PERFORM IN-FLIGHT MAINTENANCE PROCEDURE WITH EVA OR JETTISON THE DEPLOYED ASSEMBLY.  
 (C,D) POSSIBLE LOSS OF CREW/VEHICLE AFTER TWO FAILURES IF DA CANNOT BE SECURED FOR REENTRY OR JETTISONED. REENTRY WITH GIMBALS UNLOCKED MAY CAUSE DAMAGE TO THE RADIATOR.

EFFECTS ON MISSIONS REQUIRING KU-BAND SYSTEM SUPPORT - 2/2  
 (A) NO EFFECT ON EPDC.

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(B,C,) LOSS OF ALL MISSION OBJECTIVES REQUIRING KU-BAND COMM DATA PROCESSING OR RENDEZVOUS RADAR.

(D) NO EFFECT.

EFFECTS ON PROVIDING DATA TO NSP FOR STATE VECTOR UPDATE - 1R/3.

(A) NO EFFECT ON EPDC.

(B,C,D) LOSS OF ONE OF THREE REDUNDANT PATHS TO SUPPLY DATA TO NSP FOR STATE VECTOR UPDATE. UHF PROVIDES AN INDEPENDENT PATH FOR STATE VECTOR UPDATE. AFTER FOUR FAILURES POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF STATE VECTOR UPDATE. NOTE- A SINGLE FAILURE OF A KU-BAND SPA DASH NUMBER -4001 CAN CAUSE THE LOSS OF POWER TO BOTH NSP'S, RESULTING IN ONLY ONE REMAINING PATH (UHF) TO UPDATE THE STATE VECTOR. THIS FAILURE CAN OCCUR DURING ANY MISSION PHASE. (KU-BAND POWERED ON OR OFF.)

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A,B,C,D) REFER TO APPENDIX D, ITEM # 1, CIRCUIT BREAKER

(B) TEST

GROUND TURNAROUND TEST- PERFORM RADAR SELF-TEST- PERFORMED EVERY FLIGHT.

(E) OPERATIONAL USE

WORKAROUND TO REGAIN ABILITY TO CONTROL, POSITION, OR LOCK ANTENNA GIMBALS

REAL-TIME DECISION REQUIRED TO PERFORM THE GIMBAL LOCK IN-FLIGHT MAINTENANCE PROCEDURE WITH EVA OR TO JETTISON THE DA.

WORKAROUND TO REGAIN SUPPORT OF MISSION OBJECTIVES

COMM: NONE. RADAR: ATTEMPT RENDEZVOUS WITH ALTERNATE SENSORS. USE BACK-UP RENDEZVOUS PROCEDURES.

WORKAROUND TO PROVIDE THE STATE VECTOR UPDATE

THE STATE VECTOR CAN BE UPDATED VIA THE NORMAL S-BAND COMMUNICATIONS LINK OR VIA UHF/AUDIO.