

FAILURE MODE EFFECTS ANALYSIS/CRITICAL ITEMS LIST

FMEA NUMBER: EC-PWP72-36 ORIGINATOR: JSC PROJECT:EDFT-03

PART NAME: WORKSITE INTERFACE LRU/ORU PART NUMBER: SEG39126516-301 QUANTITY: 1
 PART NUMBER: SED39127410-301 LRU/ORU PART NAME: TERA SYSTEM: GFE
 LSC CONTROL NO: N/A DRAWING/REF DESIGNATOR: SEE P/N SUBSYSTEM: EVA
 ZONE/LOCATION: TERA EFFECTIVITY/AFFECT STAGE: STS-72 & SUBS

CRITICALITY:

CRITICAL ITEM: Yes SUCCESS PATHS: 2
 CRITICALITY CATEGORY: 1R/2 SUCCESS PATH REMAINING: 1

END ITEM NAME: N/A
 END ITEM FUNCTIONAL: N/A
 END ITEM CAPABILITY: N/A
 END ITEM FAILURE TOLERANCE: N/A

REDUNDANCY SCREENS:

- A/1. C/O PRELAUNCH: Pass
2. C/O ON ORBIT: N/A for NSTS
- B/3. DETECTION FLIGHT CREW: N/A
4. DETECTION GROUND CREW: N/A
- C/5. LOSS OF REDUNDANCY FROM SINGLE CAUSE: Pass

FUNCTION: The TERA Active Worksite interface is the latching mechanism to mount the TERA to a passive worksite interface during EVA operations.

FAILURE MODE CODE: N/A for NSTS

FAILURE MODE: Unable to release TERA Active WIF.

CAUSE: Contamination, galling, wear, piece part defect.

REMAINING PATHS: 1- EVA contingency bolts. EFFECT/ MISSION PHASE: EVA

CORRECTIVE ACTION: Remove EVA contingency bolts on passive WIF and jettison TERA.

-FAILURE EFFECTS-

END ITEM/LRU/ORU/ASSEMBLY: Unable to remove TERA from its temporary stowage location in bay 2 or 3.

SUBSYSTEM/NEXT ASSEMBLY/INTERFACE: N/A

SYSTEM/END ITEM/MISSION: Partial loss of DTO objectives.

CREW/VEHICLE: Unable to safely land with TERA in temporary stowage location. Vehicle damage will occur, if contingency means to remove also fail, during deorbit/landing. Possible loss of vehicle.

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HAZARD INFORMATION:

HAZARD: N/A

HAZARD ORGANIZATION CODE: N/A

HAZARD NUMBER: N/A

TIME TO EFFECT: Hours

TIME TO DETECT: Seconds

TIME TO CORRECT: Minutes

FAILURE DETECTION/FLIGHT Visual

REMARKS:

-RATIONALE FOR ACCEPTABILITY-

(A) DESIGN: The TERA Active WIF is designed to the requirements specified in JSC-33205. " Certification and Acceptance Requirements Document for the Temporary Equipment Restraint Aid (TERA) Active Worksite Interface (WIF) Assembly " and is the same design that is used on the APFR. On STS-72 it is not used as a launch restraint. It is structurally designed to withstand a 50 lb. load applied 30 in. above the active WIF interface with a safety factor of 1.4.

(B) TEST: Applicable requirements per JSC-33205.

Acceptance:

- 1) Fit check of the Active and Passive WIF performed at PDA.
- 2) Force required to the active and passive WIFs shall be between 3 and 10 lb. verified at PDA, PIA, Pre and Post Environmental test and during qualification thermal test.
- 3) Force required to activate paddles is between 2 and 10 lb. Two paddles must be depressed for actuation, and torque required to rotate locking collar is between 1 and 5 in.-lb. verified at PDA, PIA, and qualification thermal test.

Qualification:

Qualification Vibration : A vibration test was performed to the following levels for a duration of 1 minute in each axis as a part of the Bay two starboard integrated proto-flight vibration test:

X AXIS	Y AXIS	Z AXIS
20 - 80 Hz	+3 db/oct	20 - 45 Hz +10.0 db/oct
80 - 350 Hz	.040g ² /Hz	45 - 70 Hz +12.0 db/oct
350 - 2000 Hz	-3db/oct	70 - 600 Hz .050 g ² /Hz
6.1 grms		600 - 2000Hz -6.0 db/oct
		7.0 grms

Qualification / Acceptance Thermal: Functional test performed at -100°F and +200°F. During one portion of the test a interface check between the passive and active WIF is performed with a minimum temperature difference of 100°F.

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(C) INSPECTION:

Fabrication - All TERA WIF components are verified to visibly clean individually.

Test - Quality Assurance surveillance is required at all test and inspections. Discrepancy reports are written on all noncompliances.

(D) FAILURE HISTORY: None

(E) OPERATIONAL USE:

1) Operational Effect - Unable to separate WIF halves. Unable to stow TERA at end of EVA operations.

2) Crew Action - Retrieve wrench or power tool to remove passive WIF.

3) Crew Training - Crew trained in proper operation of WIF and use of tools.

4) Mission constraint - None.

5) In Flight Checkout - Proper function verified during EVA operations.

(F) MAINTAINABILITY: N/A

PREPARED BY: G. Wright

REVISION:

DATE: 8/10/95

WAIVER NUMBER:
