

FAILURE MODE EFFECTS ANALYSIS/CRITICAL ITEMS LIST

FMEA NUMBER: EC-PORT2-10 ORIGINATOR: JSC PROJECT: EDFT-03

PART NAME: OGLA	LRU/ORU PART NUMBER: SED39126406-301	QUANTITY: 1
P/N : SED39126406-301	LRU/ORU PART NAME: CABLE CADDY ASSY.	SYSTEM: GFE
LSC CONTROL NO: N/A	DRAWING/REF DESIGNATOR: SEE P/N	SUBSYSTEM: EVA
ZONE/LOCATION: PORT 2	EFFECTIVITY/AFFECT STAGE: STS-72	

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:
- C/5. LOSS OF REDUNDANCY FROM SINGLE CAUSE: Pass

FUNCTION: The OGLA holds the cable reel to a ORU grid on the transition plate. It incorporates 4 spring loaded latches activated by a over-center mechanism. The handle which drives the over-center mechanism also incorporates an additional lock and a pip pin to hold the handle in the closed position.

FAILURE MODE CODE: N/A for NSTS.

FAILURE MODE: Inadvertent release of latch pawl.

CAUSE: Contamination, piece part failure, vibration.

REMAINING PATHS: Remaining latch pawls. 2nd spring in linkage.	EFFECT/MISSION PHASE: Launch/landing.
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CORRECTIVE ACTION: None, restraint design is fail safe.

-FAILURE EFFECTS-

END ITEM/LRU/ORU/ASSEMBLY: OGLA remains restrained to ORU grid by 3 remaining latch pawls .

SUBSYSTEM/NEXT ASSEMBLY/INTERFACE: N/A

SYSTEM/END ITEM/MISSION: None

CREW/VEHICLE: 3 of the 4 latch pawls must be engaged to ensure the structural integrity of the cable caddy for launch/landing. Loose equipment in the PLB will cause significant damage to orbiter.

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HAZARD INFORMATION:

HAZARD: N/A

HAZARD ORGANIZATION CODE: N/A

HAZARD NUMBER: N/A

TIME TO EFFECT: seconds

TIME TO DETECT: N/A

TIME TO CORRECT: Immediate

FAILURE DETECTION/FLIGHT: Visual EVA only.

REMARKS:

-RATIONALE FOR ACCEPTABILITY-

(A) DESIGN: The OGLA latch is a three position latch (open, soft capture and hard capture). A latch lock is incorporated into the latch which locks the latch when it is moved into the each position. A pip pin is also used to secure the latch lock. The 4 latch pawls are driven into position by two drive linkages that are actuated by the latch handle. Springs in the linkage (4 total) prevent the linkage from being jammed if one of the pawls does not move from the soft capture to locked position. The springs also ensure that there is positive engagement of the latch pawl to the ORU grid. The OGLA is designed to the requirements specified in JSC-39193, "Certification and Acceptance Requirements Document, Cable Caddy Assembly for Detailed Test Objective 671".

(B) TEST: Applicable Requirements per JSC-38193

Acceptance: Functional (performed at predelivery acceptance, preinstallation acceptance, and pre/post environmental test).

- 1) Soft capture force to place the OGLA on a ORU grid is between 5 lb and 12 lb.
- 2) Force required to move lever from soft capture to the lock position is less than 20 lb.
- 3) Force required to actuate handle lock is between 1 lb. and 4 lb.

Qualification:

Protoflight Vibration : A vibration test was performed to the following levels for a duration of 1 minute in each axis:

X AXIS	Y AXIS	Z AXIS
20 - 30 Hz +3 db/oct	20 - 45 Hz +10 db/oct	20 - 45Hz .009g ² /Hz
80 - 350 Hz .040g ² /Hz	45 - 600 Hz .060g ² /Hz	45 -70 Hz +12 db/oct
350 - 2000 Hz -3db/oct	600 - 2000 -10db/oct	70 - 600 Hz .050 g ² /Hz
		600 - 2000Hz -6 db/oct
6.1 grms	7.7 grms	7.0 grms

Thermal/Vacuum : Cable Caddy Assy. subjected to a temperature of -100°F at a pressure of 1×10^{-5} torr.

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(C) INSPECTION:

Fabrication - All Cable Caddy Assembly components are verified to generally clean individually. The Cable Caddy Assy is verified to be visually clean at predelivery acceptance.

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 - Cable Caddy free of launch restraint. Vehicle damage will likely occur.
- 2) Crew Action - Crew must verify Cable Caddy is secure at end of EVA operations.
- 3) Crew Training - Crew trained in proper operation of OGLA during WETF training.
- 4) Mission constraint - None.
- 5) In Flight Checkout - Proper stowage of Cable Caddy verified during EVA operations, as specified in the EVA checklist.

(F) MAINTAINABILITY: N/A

PREPARED BY: G. Wright

REVISION:

DATE: 8/10/95

WAIVER NUMBER:
