

CRITICAL ITEMS LIST (CIL)

SYSTEM: ASI  
 SUBSYSTEM: Electrical Cable Trays  
 REV & DATE: J, 12-19-97  
 DCN & DATE:  
 ANALYSTS: J. Hicks/E. Howell

FUNCTIONAL CRIT: 1  
 PHASE(S): b, c  
 HAZARD REF: S.11

FAILURE MODE: Structural Failure

FAILURE EFFECT: b) Loss of mission and vehicle/crew due to LH2 tank structural failure or debris source to Orbiter from cable tray assembly.  
 c) Loss of life due to ET impact outside footprint.

TIME TO EFFECT: Immediate (b), Seconds (c)

FAILURE CAUSE(S): A: Improper Manufacture  
 B: Failure of Attaching Hardware  
 C: Failure to Slide

REDUNDANCY SCREENS: Not Applicable

FUNCTIONAL DESCRIPTION: Provide environmental protection for lines and cables routed along the LH2 tank surface.

<u>FMEA ITEM CODE(S)</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY</u>	<u>EFFECTIVITY</u>
4.3.14.1	80911001415-049 -169	Tray Assy, Forward (LH2)	1 1	LWT-54 thru 73 LWT-74 & Up
4.3.15.1	80911001415-050 -170	Tray Assy, Short (LH2)	1 1	LWT-54 thru 73 LWT-74 & Up
4.3.16.1	80911001415-059	Tray Assy, Intermediate (LH2)	5	LWT-54 thru 73
4.3.17.1	80911001415-150	Tray Assy, RSS (LH2)	1	LWT-54 thru 73
4.3.18.1	80911001415-079 -079	Tray Assy (LH2)	4 12	LWT-54 thru 73 LWT-74 & Up
4.3.19.1	80911001415-159	Tray Assy, Aft ECO (LH2)	1	LWT-54 thru 73
4.3.20.1	80911001415-160	Tray Assy, Forward ECO (LH2)	1	LWT-54 thru 73
4.3.21.1	80911001415-140	Tray Assy, Aft (LH2)	1	LWT-54 & Up

REMARKS: The cable tray assemblies are grouped as the failure mode, and causes are the same.

CRITICAL ITEMS LIST (CIL)  
CONTINUATION SHEET

SYSTEM: ASI  
SUBSYSTEM: Electrical Cable Trays  
FMEA ITEM CODE(S): 4.3.14.1, 4.3.15.1, 4.3.16.1, 4.3.17.1,  
4.3.18.1, 4.3.19.1, 4.3.20.1, 4.3.21.1

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RATIONALE FOR RETENTION

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DESIGN:

- A-C: The cable tray is machined from 2024-T8511 aluminum alloy extrusions stock. One end of each segment has slotted holes to provide capability for longitudinal motion. Fasteners in the slotted holes allow a minimum .004 inch gap between the slide block and the tray segment. Materials selected for this part number are in accordance with MMC-ET-SE16 which assures repetitive conformance of composition and properties.
- A: The cable tray is designed to the required yield (1.1) and ultimate (1.4) safety factors (ET Stress Report 826-2188).
- B: The dowel and attaching hardware are selected from the Approved Standard Parts List (ASPL 826-3500). The hardware is installed per STP2014 and torqued using values specified on Engineering drawings. Tensile installation loads are sufficient to provide screening for major flaws in individual fasteners.

TEST:

The Cable Tray Assemblies are certified. Reference HCS MMC-ET-TM08-L-S018 (LWT-54 thru 88) and HCS MMC-ET-TM08-L-S514 (LWT-89 & Up).

Vendor:

- B: Attaching fasteners and dowel are procured and tested to standard drawings 26L3, 33L9 and 22L2.

INSPECTION:

Vendor Inspection-Lockheed Martin Surveillance:

- A, B: Verify materials selection and verification controls (MMC-ET-SE16, drawings 80911001415 and 80911001417 and standard drawings 26L3, 33L9 and 22L2).
- A, C: Inspect dimensional conformance (drawing 80911001417).

MAF Quality Inspection:

- B: Inspect that attaching hardware is free from damage (drawing 80911001419 and STP2014).
- A, B: Verify installation and witness torque (drawing 80911001419).
- C: Inspect gap clearance (drawing 80911001419).

FAILURE HISTORY:

Current data on test failures, unexplained anomalies and other failures experienced during ground processing activity can be found in the PRACA data base.