

Critical Item: Signal Splitter/Combiner Assembly

Find Number: 78K00525 1 ea.

Criticality Category: 1S

SYSTEM	AREA	CRIT	TOTAL LRU'S
Hypergol Vapor Detection Sys	LOA	1S	1

SAA No: 09IT09-001

System/Area: LPS/CCMS/FR1/FR2/CR3/CR4

NASA

PMN/ L72-0500-02

Part No: 78K00525

Name: V & DA

Mfg/

Drawing/

Part No: 78K00525

Sheet No: MCR7656 VOL. III 5.2 (REV. FL)

Function: This TLCE Critical Item is used in support of a critical user system. The splitter receives ground data bus signals from a FEP and distributes the signals to multiple HIM's. The combiner accepts multiple ground data bus signals from the HIM's and combines them for transmission to a FEP.

Critical Failure Mode/Failure Mode No: * Failure Mode - Loss of Output/09IT09-001.495

* Signal Splitter/Combiner Module failures would result in loss of communications between a FEP and HIM resulting in loss of the data path for the critical system being monitored/controlled.

Failure Cause: Electrical/Electronic failure of LRU piece part

Failure Effect:

SYSTEM	FAILURE EFFECT	CRIT
Hypergol Vapor Detection System (LOA)	Loss of output signal will fail to provide the console operator with an input that would indicate a leak in the hypergol propellant servicing system. Loss of the capability to detect a leak during hazardous operations could result in loss of life and/or vehicle. Time to effect: Immediate. Detection method: Software detects loss of communication.	1S

Signal Splitter/Combiner Assembly (Continued)

SYSTEM

FAILURE EFFECT

CRIT

ACCEPTANCE RATIONALE

Design: The Signal Splitter/Combiner Assembly was designed per the requirements of the following documents.

1. CP09IT0910: General design requirements specification for LPS/CCMS.
2. CP09IT0917: Contract end item assembly specifications for V&DA for LPS/CCMS.

Test: Rigorous sets of acceptance tests were performed to verify performance and design requirements of the LPS/CCMS. This process occurred on each end item from "In Process Assembly" phase to "Site Acceptance". Master control procedures (MCPs) 78K-M401 and 78K-M701 were utilized for acceptance testing by MMC. Following this acceptance testing IBM performed integrated testing of each set. Test procedures KSC-LPS-IB-086, Book 3 and KSC-LPS-IB-105, Book 5 were utilized.

Hypergol Vapor Detection Sys

- OMRSD File VI Volume 1 requires a sensor functional test prior to each flow. OMI V3542 "Hypergol Vapor Detection System Operations Support (LPS)" provides an end-to-end verification of the system (LPS/HVDS).
- During loading operations, personnel are stationed on the RSS to provide visual monitor.

Inspection: LPS system integrity is continuously monitored by on-line software programs. These programs provide health and status to system operators. Proper V&DA operation is verified during user system end-to-end verification.

JUN 10 1997

Signal Splitter/Combiner Assembly (Continued)

Failure History:

The PRACA Data Base was used for this analyses (time frame APR. 88 to Sep. 90). There were 1 Problem Report initiated on Signal Splitter/Combiner Assemblies that relate to failure modes depicted on this CIL sheet. There is a total population of 30 signal splitter/combiner assemblies installed in various CCMS Station Sets. In the basic SAA the timeframe of Jan. 84 to Mar. 88 was used with 2 Problem Reports identified from a total population of 30 assemblies installed. Operation use varies from 7 days a week, 24 hours a day to as required.

Operational Use:

- **Correcting Action:**

Troubleshooting required to isolate and replace failed unit.

- **Timeframe:**

Varies, troubleshooting required.