Critical Item: Control Card

Find Number: 78K00450 12 ea.

Criticality Category: 1S

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SYSTEM	AREA	CRIT	TOTAL LRU'S
Hypergol Vapor Detection Sys	LOA	1S	12

SAA No: 09IT09-001

NASA Part No: 78K00450

Mfg/ Part No: None

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

PMN/ Name: L72-0400-01,-02,-03,-04 HIM

Drawing/ Sheet No: MCR7656 VOL. III 4.2 (REV CY)

Function: This HIM Critical Item is used in support of a critical user system. It decodes the HIM address to allow communication between the appropriate HIM card and a FEP.

Critical Failure Mode/Failure Mode No: * Failure Mode - Loss of Output/09IT09-001.474 * Failure Mode - Erroneous Output/09IT09-001.475

* Control card failures could cause erroneous address decoding resulting in unsolicited commands or interrupt normal HIM I/O Bus communications 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 HIM functions to/from GSE FEP.	1S

Control Card (Continued)

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ACCEPTANCE RATIONALE

Design: The Control Card was designed per the requirements of the following documents.

1. CP09IT0910: General design requirements specification for LPS/CCMS.
2. CP09IT0916: Contract end item assembly specifications for HIM 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 this 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. OMRSD, File VI requires verification of backup power to be performed every 360 days on the hardware interface module which contains this LRU. OMI C6040 "HIM Preventive Maintenance" satisfies this requirement. Proper HIM operation is verified by each user system as part of the end-to-end verification of their integrated system.

Failure History:

The PRACA Data Base was used for this analyses (timeframe APR. 88 to Sep. 90). There were 13 Problem Reports initiated on Control Cards that relate to failure modes depicted on this CIL sheet. There is a total population of 197 Control Cards installed in various CCMS Station Sets. In the basic SAA the timeframe of Jan. 84 to Mar. 88 was used with 63 Problem Reports identified from a total population of 171 cards 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.