*C1L199701
Attachment 3
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Critical Item: MUX A CARD

Find Number: 78K00361 4ea.

Criticality Category: 1S

SYSTEM	AREA	CRIT	TOTAL LRU'S
Hypergol Vapor Detection System	LOA	1S	4
Fixed Hydrogen Leak Detection System (FCSS)	LOA	1S	SHARED

SAA No:	09IT09-001	**System/Area:**	LPS/CCMS/FR1/FR2/CR3/CR4
NASA Part No:	78K00361	**PMN/ Name:**	L72-0300-01A CDBFR
Mfg/ Part No:	78K00361	**Drawing/ Sheet No:**	MCR7656 VOL.III 3.2(REV EW)

Function: This CDBFR Critical Item is used in support of a critical user system. Provides an interface with the CDBFR Memory for write operations

Critical Failure Mode/Failure Mode No: * Failure Mode - Unsolicited output/09IT09-001.466

* MUX A CARD failure could prevent a CPU from writing to CDBFR memory, or unsolicited output causing the CDBFR to become inoperative, resulting in loss of data path for critical systems 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. Detection method: System status checks will detect failure. Time to effect: Immediate.	1S
Fixed Hydrogen Leak Detection System (FCSS)(LOA)	System would fail to indicate a hydrogen leak. Could allow loss of life or vehicle during hazardous conditions. Detection method: System status checks will detect failure. Time to effect: Immediate.	1S

MUX A CARD (Continued)

ACCEPTANCE RATIONALE

Design: The MUX A CARD was designed per the requirements of the following documents.

1. CP09IT0910: General design requirements specification for LPS/CCMS.
2. CP09IT0914: Contract end item assembly specification for CDBFR for LPS/CCMS.

A single data and/or address dropped/picked bit is ECC correctable. Other error conditions (inop/uncorrectable errors) are easily detectable by software, it notifies user according to nature of problem.

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 System

- OMRSD File VI, Volume 1, Baseline 12/13, "LOA MMH/N204 Servicing System", 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.

Fixed Hydrogen Leak Detection System (FCSS)(LOA)

- OMRSD File VI, Volume 1, Baseline 10, "LOA Fuel Cell Servicing System, LH2/GH2", requires Leak Detector and LPS Function Designator end-to-end tests prior to each flow. OMI V3541 "Remote Hydrogen Leak Detection Systems Operational Support (LPS)" provides this end-to-end test.

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 inspection and power adjust/verification every 90 days. CDBFR Stress Test is performed every 180 days and card edge connector cleaning every 1800 days. OMI's, C6030 "Common Data Buffer Assembly PM" and C2030 "Common Data Buffer Stress Test" satisfy these requirements.

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MUX A CARD (Continued)

Failure History:

The PRACA Data Base was used for this analyses (timeframe APR. 88 to Sep. 90). There were 2 Problem Reports initiated on MUX A CARDS that relate to failure modes depicted on this CIL sheet. There is a total population of 67 MUX A CARDS 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 51 cards installed. Operation use varies from 7 days a week, 24 hours a day to as required.

Operational Use:

• Correcting Action:

  Switch CDBFR functions to spare CDBFR or troubleshooting required to isolate and replace failed unit.

• Timeframe:

  60 minutes