

Critical Item: GSE Interface Controller Card (GICC)
Total Quantity: 1
Find Number: 83K01180
Criticality Category: 1S

JUN 10 1997

SAA No:	09IT09-001	System/Area:	LPS COMS/FR1/FR2/CR3/CR4
NASA		PMN/	L72-0400-14/
Part No:	83K01180	Name:	HIM-II
Mfg/	Data Products New England	Drawing/	83K01102/
Part No:	(DNE) Technologies/ 830011800	Sheet No:	8-83

Function: Acts as the main system administrator and controller for the HIM operations. Monitors requests from the GSE data bus, front panel display and operating system engine (OSE). Services those requests by reading and writing the appropriate locations on the input/output cards in the HIM chassis.

Critical Failure Mode/Failure Mode No: Loss of output/09IT09-001.513. Loss of card input power/09IT09-001.514.

Failure Cause: Piece part failure.

Failure Effect: Loss of output. Loss of data link (FEP/HIM/GSE). For the Hypergol Vapor Detection System (HVDS), HIM 6397, this results in loss of capability to detect leaks during hazardous operations at Pads A and B. Possible loss of life/vehicle in the event of a hazardous condition. Detection method: System status checks will detect failure. Time to effect: Immediate.

Loss of card input power. The FEP will detect loss of HIM and inhibit further processing with that HIM. For the HVDS this results in loss of the capability to detect leaks during hazardous operations at Pads A and B. Possible loss of life/vehicle in the event of a hazardous condition. Detection method: System status checks will detect failure. Time to effect: Immediate.

ACCEPTANCE RATIONALE

Design:

- The HIM-II design requirements are defined in 83K01101 "Hardware Requirements for the Hardware Interface Module (HIM) HWCI P200-HW".
- The GICC is a commercial off the shelf (COTS) assembly. The mean time between failure (MTBF) per MIL-HDBK-217F is 70,000 hours.
- The GICC was manufactured in accordance with best commercial practices.
- GICC design provides visual indicators of central processor unit activity and status.

- Card design provides non-volatile Random Access Memory (RAM) for storing of configuration data.
- Ruggedized GICC cards have thread locking adhesive applied to fasteners to prevent loosening during vibration. Silicone adhesive is also applied to socket PROMs to prevent loosening.
- GICC design provides memory locations for status registers to store error conditions accessible to HIM front panel, maintenance ports, Operating System Engine (OSE), and GSE data bus.
- GICC design provides a Read Only Memory (ROM) resident debugger.

Test:

- OMRSD File VI Volume I, 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). This functional test verifies system sensors and HIM operations.
- During hypergol loading operations, personnel (in scope) are positioned on the RSS to provide visual monitor capability.

Inspection:

- LPS system integrity is continuously monitored by on-line software programs (i.e. HWMON, EMON, etc.). These programs provide health and status data to systems operators. FEPs poll the HIMs and their Input/Output Cards on a cyclic basis (1, 10, or 100 times/second) verifying the communication link with HIMs assigned. Along with status and health checks, exception monitoring provides operators notification of any change of state of HIM measurement cards.

Failure History:

- Current data on test failures, unexplained anomalies, and other failures experienced during ground processing activities can be found in the PRACA database. Since no units were installed at the time the analysis was performed no PRACA data was available.
- The GIDEP failure data interchange was researched and no failure data was found on this component in the critical failure mode.

Operational Use:

- Correcting Action:

For the Hypergol Vapor Detection System, loss of the HIM during loading operations would result in termination of loading. Once terminated the faulty HIM card would be replaced. Loss of the HIM at any other time would have no critical effect.

- Timeframe:

Replacing a failed component or card would take approximately 30 to 59 minutes.