

USA Ground Operations CIL Sheet

Critical Item: ATM - FE Bridge Chassis

Criticality Category: 1

NASA Part No: None

Total Quantity: 1

Mfg/Part No: Cisco Systems Inc. / 2820

System: Checkout and Launch Control System

Find No.	Qty	Area	PMN	Baseline	Drawing / Sheet
52452A6	1	HMF	L72-5300	090.10	84K09908-002 / 16

Function:

Provides a means to switch data in the ATM protocol to the Fast Ethernet protocol and vice-versa. The ATM-FE Bridge also controls the HMF side of the VLANs and helps to isolate the data from the DRP from the rest of the network traffic.

Failure Mode No. Failure Mode	Failure Cause Failure Effect	Detection Method Time to Effect	Crit Cat
01IT03-002.007 Corruption of Data	Internal Component or Software Failure Invalid data would be recorded to the SDC and/or be presented to the console operator. Making a critical decision based on invalid data could result in loss of life and/or vehicle.	None Seconds	1

ACCEPTANCE RATIONALE

Design:

- Worldwide Standards Compliance
 - International
 - International Electrotechnical Commission IEC 950, Safety of Information Technology Equipment
 - United States
 - Federal Communications Commission (FCC) Part 15, Class B, Electromagnetic Compatibility (EMC)
 - Underwriters Laboratory (UL) Listed UL-1950, Low Voltage Safety
 - Canada
 - Canadian Standards Association CSA C22.2 No. 60950, Safety of Information Technology Equipmer
 - Europe
 - European Norm EN50081-1 and EN50082-1, EMC Emissions and Immunity respectively (CE Mark)
 - European Norm EN60950, Low Voltage Safety (CE Mark)
 - Japan
 - Voluntary Control Council for Interference (VCCI) from Information Technology Equipment compatibl Class B, EMC
- Designed to industry standards.
- Employs multiple levels of error checking utilizing Cyclic Redundancy Checks (CRCs) and checksums to reduce the likelihood of corruption of data during transmission between endstations.
- All input power is delivered to the hardware through CLCS Power Distribution Chassis (PDCs) which employ Electromagnetic Interference (EMI)/Radio Frequency Interference (RFI) filtering and Transient Voltage Surge Suppression (TVSS).
- The ATM-FE Bridge utilizes Virtual Private Networks (VPN) to logically isolate the CLCS control room Data Recording Processor (DRP) traffic from the rest of the aggregate traffic flowing through it.

Test:

• Under the provisions set forth in 84K00071 "CLCS Hardware Development Plan" the following tests were performed:

- 84K07290-004-02 "Test Specification, Receiving Inspection Test (RIT) Procedure for Cisco Catalyst 2820 Switch" - a unit test.
- 84K03504 "Hardware Specification and Design Verification Test (DVT), Network Switches" - a unit design test.
- 84K07210-010-02 "Hypergolic Maintenance Facility (HMF) Hardware Installation Test (HIT)" - an integrated connectivity test.
- 84K07211 "Hypergolic Maintenance Facility (HMF) Hardware Validation Test (HVT)" - an integrated functionality test.

• CLCS HMF Level 5 User Acceptance Testing as outlined in 84K00190, "CLCS Certification Plan".

Inspection:

• No inspections or preventative maintenance is accomplished on this item.

Failure History:

• Current data on test failures, unexplained anomalies, and other failures experienced during ground processing activities can be found in the PRACA database. The PRACA database was researched and the following data was found on this component in the critical failure mode.

- P-V6-362655, initiated on 09/08/00, states that the HMF Cisco 2820 ATM switch was recording a high number of Cyclic Redundancy Check (CRC) errors.
- P-V6-362273, initiated on 12/18/00, states that the PCGOAL Shuttle Data Stream (SDS) was having sequence errors.
- Both of these PR's were dispositioned in the following manner. The operating software on the ATM switch at the HMF was upgraded from version 11.3(1) to 12.0(7). This resolved the problem with the CRC error; however, the SDS errors were still occurring at a rate of 16 errors over a 20 hour period. As a result, the ATM Transmission System (ATXS) had several tests run against it and engineering determined that the ATXS was not causing the PCGOAL errors. It was then found, that on the other side of the ATXS, the CLCS Inter-Set Network gigabit switch router was having an IP Multicast problem. This issue was resolved by the upgrading of the operating system software in the gigabit switch router which in turn also solved the PCGOAL error problem because the error rate dropped to an acceptable 1 error in a 22 hour period. Since these actions were implemented the problems have not occurred again.

Operational Use:

Correcting Action	Timeframe
There is no action which can be taken to mitigate the failure effect.	Since no correcting action is available, timeframe does not apply.