

USA Ground Operations CIL Sheet

Critical Item: Programmable Logic Controller (PLC) CPU Module
NASA Part No: None
Mfg/Part No: General Electric / IC697CPU781
System: 325 Ton Bridge Cranes

Criticality Category: 1
Total Quantity: 2

Find No.	Qty	Area	PMN	Baseline	Drawing / Sheet
Rack 0 Slot 1	1	VAB HB-1.2	H72-1200-01	389.00	EB-2508 / All
Rack 0 Slot 1	1	VAB HB-3.4	H72-1200-02	389.00	EB-2508 / All

Function:

Performs all control and monitor functions of the main and auxiliary hoists, bridge, and trolley.

Failure Mode No. Failure Mode	Failure Cause Failure Effect	Detection Method Time to Effect	Crit Cat
09FY120-001.016 Unsolicited command	Internal component failure or software failure. PLC could initiate or continue a crane motion in an uncommanded direction or speed resulting in loss of life, vehicle and/or loss (damage) to a vehicle system.	Visual 1 second	1

ACCEPTANCE RATIONALE

Design:

- Designed to industry standards. UL listed.
- Internal diagnostics verify all crane controls each time the crane is used.
- The PLC is electrically isolated from external voltages/currents.
- Overspeed activated redundant hoist brakes prevent free fall of the load.
- The E-stop circuits are hardwired to shunt-trip circuit breakers capable of terminating facility power to the crane.
- The software was written and incorporated by the crane contractor.

Test:

- Crane software was validated and extensively tested per the acceptance test procedure.
- Before each use, functional checks of the hoists, trolley, and bridge will be performed in all axis per OMI Q3521.
- Before each use, functional checks of the limit switches and E-stops will be performed per OMI Q3521.
- Proofload and extensive functional tests were performed in accordance with NSS/GO 1740.9 per the acceptance test procedure.
- OMRSD File VI requires the performance of an annual operational test to verify proper operation of all crane controls. The test will cycle the PLC internal diagnostics and show that the crane PLC performs as expected.

Inspection:

- Control cabinet EMI seals are inspected monthly per OMI Q6339.
- Control cabinets and wiring are inspected annually for loose connections, security of mounting, integrity of insulation and general cleanliness per OMI Q6339.

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. One preventive maintenance Problem Report associated with this component was found but not in the critical failure mode.

Operational Use:

Correcting Action	Timeframe
• Operator or observers may mitigate the failure effect by pushing the E-stop.	3 seconds