



PFR-169 Title: Plasma Discharge Damage to Ion Detectors

Assembly : SST	SubAssembly : Sensor	
Component : Detector	Units Affected:	Units fixed:
Originator: Davin Larson	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
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Failure Occurred During (Check one √)

☐ Functional test ☐ Qualification test ☐ S/C Integration ☐ Launch operations ☒ Other (Calibration)

Environment when failure occurred:

☐ Ambient ☐ Vibration ☐ Shock ☐ Acoustic
☐ Thermal ☒ Vacuum ☐ Thermal-Vacuum ☐ EMI/EMC

Problem Description

(In this section it is important to document the specific symptoms of the problem. In the event we see it happen again, we would like to know as much as possible.)

Poor instrument performance in ion detectors. Units affected are SEA-14-10 and SEA-29-11. Only ion detectors on DFE boards 10, 29 and 11 were damaged. No other sensors had undergone electron calibration once discovered.

Analyses Performed to Determine Cause

(How do we know how the failure happened? Was it a bad part, bad handling, what?)

During electron calibration, plasma discharge within the electron gun produced large negative ion fluxes that damaged ion detectors that happened to be in the field of view. Results were duplicated on ETU unit. Electron detectors showed no damage from discharges.

Corrective Action/ Resolution

(How do we fix the unit? And how do we make sure it doesn't happen again?)

Electron gun refurbished and electron calibrations only performed with ion detectors covered. Detectors on affected DFE boards were replaced on 12/13/05.

Acceptance:

MAM: Ron Jackson _____ ; MSE: Ellen Taylor _____

PM: Peter Harvey _____ ; Cognizant Engineer _____

Date of Closure _____