PFR-009 Title: SST Sensor Attenuator Failure

Assembly : THM-SST-MEC-010	**SubAssembly :** N/A
Component : SST Sensor	**Unit Serial #:** THM-SST-FLT-002
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Failure Occurred During (Check one √)

□ Functional test √ Qualification test □ S/C Integration □ Launch operations

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 which exhibited the problem. In the event we see it happen again, we would like to know as much as possible.)

Attenuator failed to open and close completely during the first hot soak. This progressed to an inability of the attenuator to remain in the open position.

Analyses Performed to Determine Cause

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

Post-thermal vacuum test inspection led to the discovery of a heat damaged SMA actuator. The SMA wires appeared to be in a permanently contracted state which is known to occur when SMA wires are heated beyond maximum operating temperature limits (ie: 250° C).

Probable cause of failure is short-circuit in an external test harness between the +25 Volt heater and +5V Attenuator-Close lines. This would cause an out-of-spec voltage potential at the SMA input and lead to overheating of the SMA actuator wires.

Corrective Action/ Resolution

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

Damaged SMA assembly on THM-SST-FLT-002 was replaced and mechanism operation was re-verified.

Harness will be replaced/repaired prior to future thermal vacuum tests.

Acceptance:

MAM: Ron Jackson_____; MSE: Ellen Taylor_____

PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____