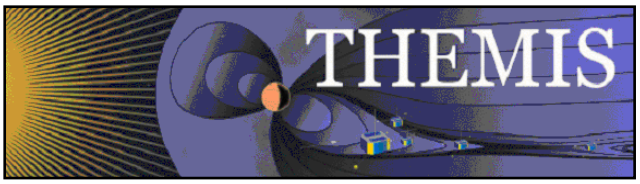

Problem/Failure Report
THM_PFR_068

PFR-068 Title: SMA monitor disturbance by actuator current

Assembly : FM1 IDPU	**SubAssembly : PCB SN004**	
Component : SMA power	**Units Affected:**	**Units fixed:**
Originator: Corinna Chen	x x x x x x	x x x x x x
Organization: Themis	**Date: June 27, 2005**	
Phone: 510 642 8030	**Email : corinnac@ssl.berkeley.edu**	

Failure Occurred During (Check one √)

√ Functional test □ Qualification test □ S/C Integration □ Launch operations □ Other (Flight Assy)

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.)

During thermal vacuum deployment tests with FM1 suite, it was observed that the voltage monitor for the SMA would be on full scale when the actuator supply was drawing current to actuator simulators. These instances occurred at a state where only the actuator was armed and commanded; yet a voltage was observed to be firing on the SMA line.

Analyses Performed to Determine Cause

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

Deployment tests were performed again during post-TV CPT of FM1 suite. The anomaly was observed and consistent. The SMA voltage monitor appeared to be on during all actuations.

Corrective Action/ Resolution

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

As part of the flight software design, when a actuator is armed and fired, the software enable the SMA CTRL line that enable the SMA power line from the circuit found on the LVPS. This is concluded to be safe for the flight suite. The Power Controller Board (PCB) has switches for each individual SMA line. A particular SMA's control voltage must be enabled in order for the SMA power to be applied. During actuations of motors and booms, a full scale SMA voltage readback is within normal operations.

Acceptance:

MAM: Ron Jackson_____; MSE: Ellen Taylor_____

PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____