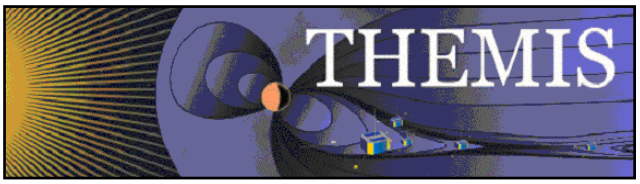

Problem/Failure Report
THM_PFR_209

PFR-209 Title: Spin Balance Mass

Assembly : Probe	**SubAssembly : n/a**	
Component : spin bal masses	**Units Affected:**	**Units fixed:**
Originator: Paul Turin	x o o o x o	x o o o x o
Organization: SSL	**Date: 23 August 06**	
Phone: 510-642-5289	**Email :pturin@ssl.berkeley.edu**	

Failure Occurred During (Check one √)

□ Functional test □ Qualification test □ S/C Integration □ Launch operations X Other (Spin bal)

Environment when failure occurred:

□ Ambient	□ Vibration	□ Shock	□ Acoustic
□ Thermal	X 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.)

During the initial spin balance of probes 1 and 5 it was determined that excessive balance mass would be required to pull the probe CG into the desired target of 0.180" radius.

Analyses Performed to Determine Cause

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

During the initial spin balance of probes 1 and 5 it was determined that approx. 3kg of bal mass would be required to meet the EFI-imposed requirement of a maximum CG offset of 0.180". This would not only cause the total probe mass to be significantly higher than expected (causing a hit to the deltaV budget unacceptable to the PI), but would require mounting far more mass to the bal mass attachment points than they were designed for with potential structural impacts. Alternatively, less mass could be used at the cost of an additional CG offset and spin axis tilt and a resulting impact on the performance of the EFI instrument.

Corrective Action/ Resolution

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

Subsequent reevaluation of the required compensation masses installed during spin bal to account for the difference between stowed and unstowed mag booms resulted in a significant change in said masses. These needed compensation masses were eventually validated by two independent analyses / engineers, one in Solid Works and the other using first principles in Excel. Upon rebalancing, we were able to hit the original CG target using approximately 1.7kg total bal mass. This amount of mass was acceptable to the PI. The largest bottom deck mass is within 50g of the designed maximum for the respective insert (800g vs 750g). It is the judgment of the LME that this exceedance is not sufficient to justify a reanalysis of the relevant structure. This is further mitigated by additional attach points added to the lower masses to prevent unscrewing of the single mass attach bolts in the original SAI design. These additional points will mitigate bending loads on the insert and help distribute the additional load.

Acceptance:
MAM: Ron Jackson_____; MSE: Ellen Taylor_____

PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____