

<p><b>Proposed Change Level (Circle): 3</b></p> <p><b>Proposed Change:</b> Decrease orbit perigee to comply with ODA guidelines.</p>	<p><b>Lead Engineer:</b> Taylor</p> <p><b>Subsystem:</b> Systems</p>
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**Reason for Change:**  
 The insertion orbit of the THEMIS probes has been changed to meet orbital debris guidelines for the Delta II second and third stages.

**Reference Documentation Summary**

**Subsystem Impacted:** (Bold indicates an impact)

ACS	C&DH	Mechanical	Propulsion	Booms	IDPU S/W
Battery	EGSE	MGSE	RF Comm	EFI	SST
Bus	Harness	Mission Ops	Solar Array	ESA	SCM
Avionics Unit	I&T	Power	Thermal	FGM	
BUS S/W	<b>Launch Vehicle</b>			IDPU	

**Minutes Summary (Systems Engineering Meeting):**  
 To meet ODA guidelines, the following orbit parameters should be analyzed by JSC.

2nd Stage: Perigee Altitude = 305 km; Apogee Altitude = 2429 km; Inclination = 22.75 deg; Argument of Perigee = 345 deg; RAAN = target\_RAAN - 1.8 deg

3rd Stage: Perigee Altitude = 305 km; Apogee Altitude = 70661 km; Inclination = 9.5; Argument of Perigee = 0 deg; RAAN = target\_RAAN

Pending the analysis, allocations for delta V and mass will change accordingly. It is expected that the 9.5 degree inclination will provide approximately 20kg additional mass to orbit (above the 800kg baseline). Estimated increase in DeltaV required to accommodate decrease in perigee and increased insertion errors is: 566m/s + 25m/s (perigee, inc) + 37m/s = 628m/s CBE. NTE will be set at 30% over CBE, or approximately 816m/s.

<p><b>Approval</b></p> <p><b>Project Manager</b> _____</p> <p><b>Systems</b> _____</p> <p><b>Impacted Subsystem Lead</b> _____</p>	<p><b>PROPRIETARY</b></p> <p>YES <input type="checkbox"/> NO <input type="checkbox"/></p>
	<p>Date _____</p>

**Distribution**

- Subsystem trades (level 4) can be made within the resources of the subsystem. Systems Engineer insight and involvement.
- Trades that impact subsystem/system interfaces or resource allocations (level 3/level 2) require concurrence by the Configuration Control Board (CCB): Principal Investigator, Project Manager, Mission Systems Engineer (MSE), Probe Systems Engineer, Mission Operations Manager and affected Team Leads. GSFC Mission Manager insight.
- Trades that impact Level 1 *baseline* science/programmatic requirements must include approval by Principal Investigator and GSFC Mission Manager.
- Trades that impact Level 1 *minimum* science/programmatic requirements must include approval by NASA HQ.

Date \_\_\_\_\_