European Space Agency

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No.41 - Preparing for Ion Drive Firing

22 Jul 2005

Overall Status

During the period 20 June to 17 July 2005, SMART-1 ground activities focused on planning and preparing for the upcoming firing of the ion drive.

It is planned to exhaust all the Xenon available in the tank going beyond the design limit of 2 kg. This has required special simulations and the development of new procedures.

The EP planned activities are summarised below:

Thrust Starts	2 August 10:21
Thrust Ends	14 September 18:29
Interuptions (to avoid double stracker blindings)	7 August 13:32 - 11 August 02:28 21 August 19:34 - 25 August 03:32 6 September 07:21 - 10 September 01:14
Orbit	207 revolutions of about 5 hours each
Coast at Perilune	49 minutes
Coast at Apolune	112 minutes
Thrust on Ascending Arc	68 minutes (true anomaly 62° and 144°)
Thrust on Descending Arc	68 minutes (true anomaly -144° and -62°)
Perilune Height	At Start: 430 km 20 August: 411 km At End: 462 km
Apolune Height	At Start: 2889 km 20 August: 2918 km At End: 2866 km
Xenon	
At Start	6.05 kg
At End	0.565 kg
Useage	5.485 kg

The moon eclipse period starts on 19 October and ends on 22 December. By then the thrust spiral must be terminated, as the EP cannot be operated during this period.

Future Activities

In the coming weeks mission activities will be focused in a number of areas including:

- Finalisation of the preparation and start of the EP orbit Re-boost in August
- Start work for next phase of ground automation activities.

Spacecraft Status

The spacecraft status is good with all functions working nominally.

Orbital Information

SMART-1 OD335 – Close to Apolune 912
Epoch (UTC) 2005/07/18 11:14:28.0

Elements WRT Moon and its equator of date	
Pericentre Distance (km)	2204.644615
Apocentre Distance (km)	4600.376088
Semi Major Axis (km)	3402.510352
Eccentricity	0.352054
Inclination (°)	90.263741
Ascending Node (°)	237.447509
Argument of Pericentre (°)	247.553315
True Anomaly (°)	180.023828
Osculating Orbital Period (h)	4.947143

The changes since apolune 878 are as follows:

- Semi-major axis: -0.3 km
- Perilune height: -24.8 km
- Apolune height: +24.1 km
- Orbital period: -0.0 min

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