

## **A Navigation Summary of OMM14 Performance**

OMM14 was successfully implemented on 20 April 2000 at the scheduled burn centroid time of 15:56 UTC. This maneuver occurred on orbit number 35,987 near the boundary between repeat cycles 279 and 280 (pass #2). The ideal maneuver magnitude (after the tweak) and the commanded value were both 6.8 mm/sec. This maneuver was applied in the orbit along-track direction to increase the mean semi-major axis by ~ 14.6 meters to reverse the satellite ground track drift westward and thereby remain inside the +/- 1 km control band. At the time of the maneuver, the ground track was ~ 855 meters east of the reference ground track, having a projected control band exit on 23 April 2000.

Operational orbit determination solutions following the maneuver were used by the NAVT to estimate an achieved maneuver magnitude of 6.605 mm/sec, which is ~ 2.87% lower than the commanded value of 6.8 mm/sec. The achieved change in semi-major axis was 14.176 meters compared to a design value of ~14.6 meters. This was based on a tracking arc of 4 days.

Based on the above brief performance evaluation and due to changes in the orbit due to drag, solar activities, anomalous forces, and luni-solar perturbations, the ground track is expected to exit the control band in the middle of September 2000 near repeat cycles 295 and 296.

To enhance future maneuver design activities, and compensate for errors in OMM14 execution and/or in predicting solar activities and anomalous forces, the NAVT will recommend use of full/partial lead/lag positioning of the solar array while flying backward in the next two fixed yaw periods. The exact placement of the lead/lag strategy depends on the future behavior of the anomalous forces and solar activities, and their effect on the ground track.

Ahmed Salama  
Project Element Manager  
Navigation & POD  
TOPEX/Poseidon