

Assumptions

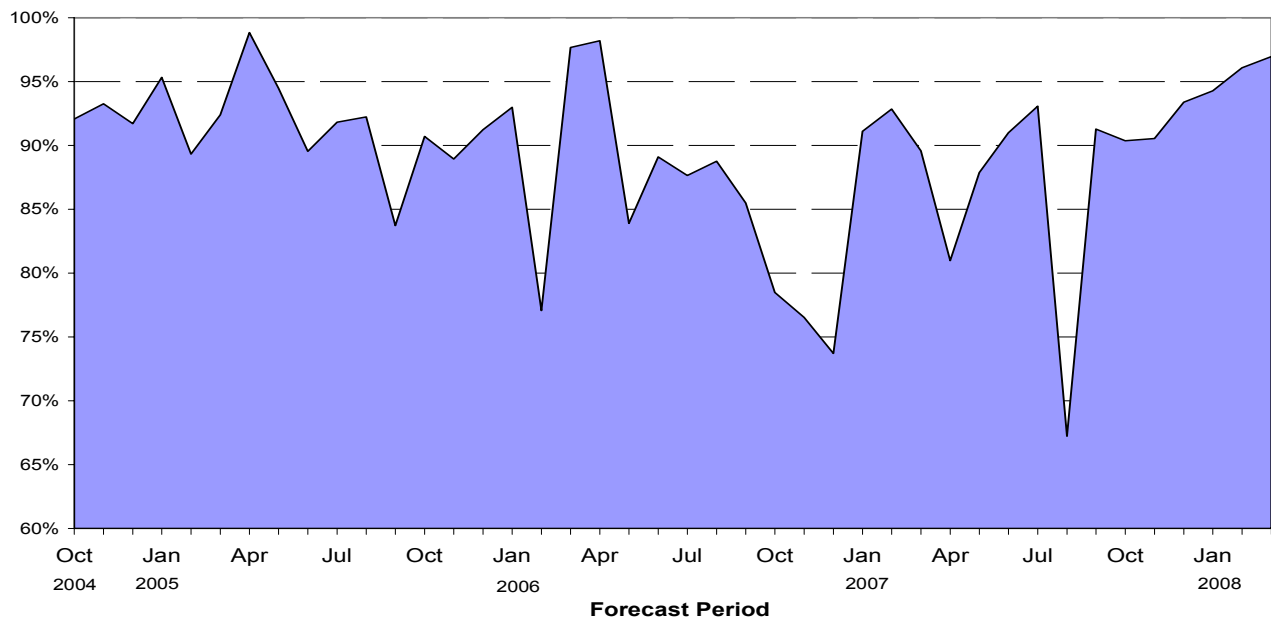
1. For the purposes of this study, Ulysses reduced time that has resulted from RARB negotiation is considered to be 100% of the requirement for the periods in which the reductions occur. (Refer to Figure 1 for periods where the average track duration is <10 hours.)
2. This assessment does not include loading that may result from periods of antenna downtime (listed below) proposed for approval at the February 10, 2004 RARB.
2005: DSS-34 weeks 07-14, DSS-15 weeks 17-18, DSS-25 weeks 22-23, DSS-54 week 28
2006: DSS-45 weeks 41-49
2007: DSS-54 weeks 23-30
3. This assessment does not include loading that may result from adding new mission requirements to support the STEREO-A and STEREO-B launches planned for February 11, 2006, the SELENE launch planned for July 23, 2005, or the Venus Express launch planned for August 26, 2005.

Assessment

Figure 2 shows the forecast monthly supportable percentage of requested time for the study period. Ulysses should expect to receive above 85% of the time requested on average for most of the extended mission. Supportable time does however decline significantly below 85% in February 2006, October through December 2006, and again in April and August of 2007.

In February of 2006, Ulysses requirements average about 75% supportable. Ulysses has contention on the 34BWG1 Subnet with the New Horizons continuous support requested during their post-launch early operations phase. If utilized, the option to forecast a portion of the Ulysses daily 10-hour request on 34HEF resources causes contention with the Mars Reconnaissance Orbiter continuous support requested during their approach phase. The Ulysses view period is fully overlapped by the Mars and New Horizons view periods and capacity in the Ulysses view period on the 70M Subnet is low. Note: effects of the STEREO launch requirements cannot be evaluated until view periods for the February 11, 2006 launches are available.

Figure 2. Ulysses Extended Mission Monthly Supportable Percentage of Requested Time



In October through December 2006 the Ulysses requirements are forecast 75% supportable. In October, DSS-24 is down and the two 34BWG1 antennas that remain in operation are oversubscribed with requirements supporting DSS maintenance, Mars Global Surveyor, Mars Reconnaissance Orbiter, MESSENGER, New Horizons, Rosetta, Voyager 2, and Wind. The view periods for these missions fully overlap the Ulysses view period at Goldstone and Madrid and all but 4 hours of Ulysses Canberra view period. At the February 2003 RARB Ulysses reduced the pass duration on each pass requested to 4 hours to resolve contention for their time on the subnet. The low supportable percentage forecast for Ulysses negotiated support in October is an effect of the other users unresolved contention forecast over the entire Ulysses view period. Ulysses should expect to receive all of the support that they have negotiated.

In November and December 2006 the Ulysses request is for 10 hours of daily tracking. The spacecraft is in view only from the DSN Canberra Complex. Downtime is planned at DSS-45 from the first week in November through the end of the year. Ulysses has contention with DSS Maintenance, M01O mapping, MGS mapping, MRO prime science, solar conjunction and Ka-band operations, SOHO keyhole operations, STEREO A and B prime science, and Voyager 2. The downtime and the constraints of the Ulysses southern view period eliminates the possibility of using the 34HEF Subnet as a means to reduce contention with other users of 34BWG1 resources while maintaining support for Ulysses at the requested levels.

In April of 2007 the Ulysses requirement is for 10 hours of daily tracking and on average, the requirements are 80% supportable. Mars Reconnaissance Orbiter Ka-band operations, MESSENGER, Hayabusa re-entry, STEREO A and B prime science, and Wind also require support on the 34BWG1 Subnet. Ulysses is in view only from the Canberra Complex and capacity in the Ulysses view period on the 70M and 34HEF Canberra antennas is low.

In August of 2007, the Ulysses requirement is for 10 hours of daily tracking and on average the requirements are forecast 68% supportable on the 34BWG1 Subnet. The Phoenix launch is planned for August 9, and the project requires continuous coverage from L to L+16 days. Ulysses has contention with the launch support and requirements supporting Cassini tour, MGS mapping and beta supplement, Mars Reconnaissance Orbiter Ka-band operations, STEREO-A prime science, and Voyager 2. The Ulysses view period is overlapped >70% by the Mars, Saturn, STEREO, and Voyager 2 view periods.

Overall Ulysses should expect to receive most of the time requested. The flexibility identified in the requirements to utilize the 70-meter subnet or some downlink tracking on the 34HEF subnet should provide scheduling latitude to resolve periods of minor contention. This flexibility may also prove useful to when the SELENE and Venus Express requirements are added to the database or when the proposed downtime periods are approved and implemented. To resolve contention with other users of the DSN resources in the four periods detailed above, because capacity in the Ulysses view period is low or because Ulysses has view only from the Canberra Complex, some reduction in requested time may be necessary.

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