

October 24, 2002

JLV-1002

To: Eugene. Burke**From:** Jose Valencia**Subject:** Selenological and Engineering Explorer (SELENE) special study**Reference:** Request from David Morris to perform a SELENE DSN load study

Introduction

The Resource Allocation Planning and Scheduling Office (RAPSO) has performed a special study to determine the number of SELENE supportable hours in 2005 and 2006 and to assess the impact on DSN antenna resources. In addition, the study identified potential periods of contention with other users of DSN resources during SELENE Launch and Early Orbit Phase (LEOP), Lunar Orbit Insertion (LOI) and Orbital Correction Maneuvers (OCM). Reference documentation includes: Navigation Profile dated January 2002, User Loading Profile (ULP) dated August 2002, and SELENE Network Operations Working Group (NOWG) Mission Outline dated May 2002.

Summary Of Study

SELENE is planned for launch in the week of July 18, 2005 (week 29) from Tanegashima, Japan by an H-IIA launch vehicle. The user is requesting DSN 34BWG1 and 26-meter coverage from Goldstone and Madrid to support LEOP and LOI from launch through week 34, 2005. In addition, the user is requesting 26-meter coverage in weeks 23 and 24, 2006 to support OCM's.

SELENE is forecast to receive approximately 310 hours of supportable time or 99 % of its requested support in 2005, and is forecast to receive approximately 118 hours of supportable time or 100% of its requested support in 2006.

Scope Of Study

1. To perform a DSN antenna load study using the FASTER software tools, and SELENE view periods. Reference documentation includes the May 2001, NOWG Mission Outline and User Loading Profile (ULP).
2. To provide an estimate of user *Requested Hours* for support and to forecast user *Supportable Hours* from launch through August of 2006.

- To identify significant events and Major Antenna Downtimes that forecast potential contention periods with SELENE's requested DSN support in 2005 and 2006.

DSN Support Resource Assessment

For launch coverage SELENE is requesting DSN support from launch week 29 through week 34 of 2005. In addition, SELENE is requesting only two weeks of DSN coverage in 2006. Figure-1 shows the forecast hours of support in these weeks. The light blue colored bar graph illustrates the user *Requested Hours* for support as listed on the SELENE User Loading Profile (ULP) figure-3. The dark blue bar graph is a forecast of *Supportable Hours*. The grayish line is the percentage of *Requested hours* the user is forecast to receive each week. For example: In week 30 the user is requesting 100 hours of support, as illustrated by the light blue bar, but will only receive approximately 98% of its requested 100 hours (supportable hours).

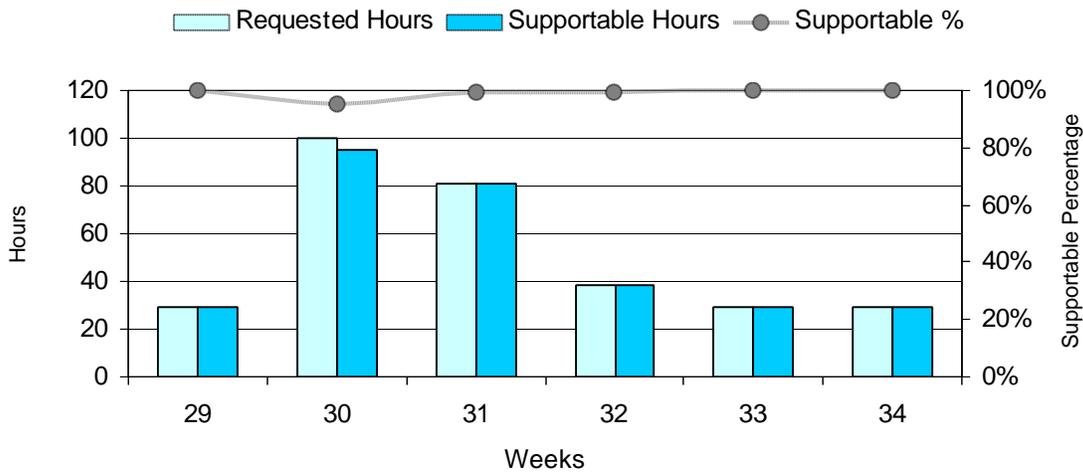


Figure-1: SELENE forecast hours of support in 2005

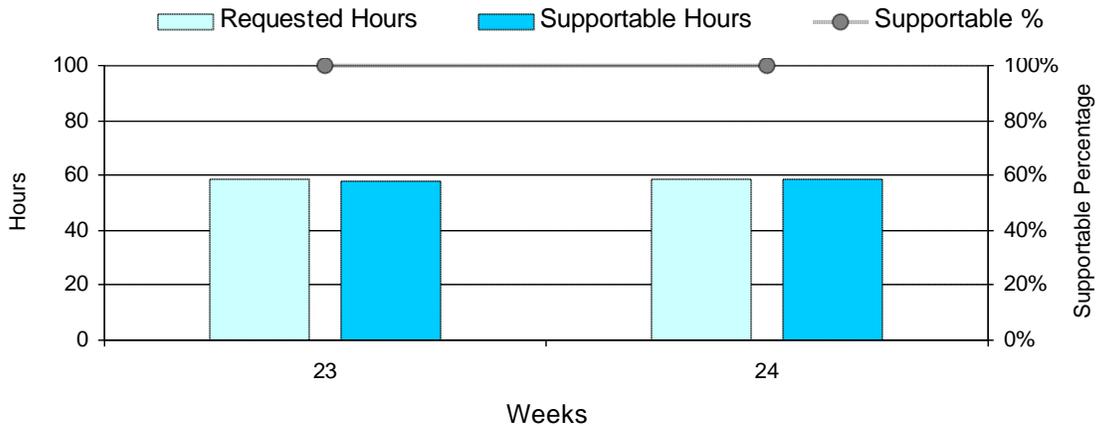


Figure-2: SELENE forecast hours of support in 2006

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SELENE is requesting 26-meter and 34BWG1 coverage for launch support planned for week 29, 2005. For post launch support from week 30 through 34 the user is requesting 26-meter support from DSS-16, and DSS-66. In 2006, SELENE is requesting only two weeks of coverage from DSS-16 and DSS-66 for Orbital Correction Maneuvers in week 23 and week 24.

- Major Antenna Downtimes
Currently, there is no 26-meter or 34-meter major antenna downtime scheduled in 2005 or 2006 that create a contention with SELENE's requested support.
- Significant Events
There are no significant events in 2005 and 2006 that create a contention with SELENE's requested DSN support.

CONCLUSION

SELENE is planned for launch in the week of July 18, 2005 (week 29) and is forecast to receive approximately 310 hours of supportable time or 99 % of its requested support in 2005, and is forecast to receive approximately 118 hours of supportable time or 100% of its requested support in 2006.

There are no major antenna downtimes or mission significant events that create contention periods with SELENE's requested DSN support in 2005 and 2006.

This study was completed October 24, 2002 and reflects SELENE's request for DSN support as of this date.

cc:

A. Andujo
G. Burke
N. Lacey
S. Lineaweaver
E. Hampton
D. Morris

15-Oct-02

User Loading Profiles

Concurrence:

Project Manager

Date

SELENE

VP	Object	User	Resource	Durations		Calibration		Month																																																
				Ave	Min	Pre	Post	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
2005																																																								
SELN	SELE	Launch	26M,34B1	4.0	4.0	0.70	0.25																																																	
SELN	SELE	LOM/CIRC	DSS-16,66	4.0	4.0	0.50	0.25																																																	
SELN	SELE	OCM	DSS-16,66	4.0	4.0	0.50	0.25																																																	
2006																																																								
SELN	SELE	OCM	DSS-66,16	4.0	4.0	0.70	0.25																																																	

Figure-3: SELENE User Loading Profile 2005, 2006