

# **An Asset Contention Period: DSN's '03/'04 Challenge**

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## **Background**

NASA's Deep Space Network (DSN) is an international network of antennas that support interplanetary spacecraft missions and radio and radar astronomy observations for the exploration of the solar system and the universe. The network also supports selected Earth-orbiting missions and collaborates with international partners such as European Space Agency (ESA), NASDA, CNES, etc.

## **The Challenge**

By the end of year 2003, and into the first quarter of 2004, the highest density of critical deep space mission support demands in NASA's history will be placed upon the DSN. A myriad of launches, landings, encounters, and other critical maneuvers could potentially overload the already busy tracking and ground communications network that controls NASA's deep space missions.

Late definition of the 2003-2004 mission set led to unusually short notice and identification of potential DSN capacity shortfalls in terms of available antenna apertures and ground communications bandwidth. In light of the potential overload, measures were taken to mitigate JPL's risk of not meeting mission support commitments. Hence, the moniker ACP (Asset Contention Period) was defined.

## **Meeting the Challenge**

With the ACP now a reality, a planning effort was launched to strategically reduce/remove potential risk during the '03/'04 critical support window by implementing a series of technical enhancements within the DSN and closely monitoring progress while coordinating other ongoing implementations. The enactment of strict scheduling standards, the development of an integrated master schedule, and the formation of a scheduling coordination/risk mitigation focus group helped to monitor progress, coordinate activities, and identify risk.

## **Integrated Master Schedule**

Coordination, risk assessment, and master schedule development became the responsibility of a newly formed Schedule Coordination Group (SCG). The SCG, composed of management personnel from selected Deep Space Mission Systems (DSMS) organizations, implementation engineers, and scheduling analysts from JPL's Resource Management section, contained the right skill mix to identify technical and logistical risk and to assist in proposing sound methods of mitigation.

The SCG was tasked with developing an Integrated DSMS Master Schedule capturing the development and implementation milestones of critical new ACP capabilities along with planned implementations. Key to the schedule was the identification of linkages (dependencies) between critical key milestones and the incorporation of these links into a scheduling tool.

Next, a rigorous configuration management process was put into place to protect key milestones. The process provided a very explicit set of steps and approvals required to modify completion dates of key milestones and those milestones impacting key milestones. The SCG was tasked with reviewing proposed schedule modifications and providing recommendations to the assigned approval authorities on a case-by-case basis.

DSN operations represented another area of concern. With new capabilities come new operations and maintenance procedures. Successful operation and maintenance of DSN subsystems require expertise of personnel at all three of the major DSN complexes. Therefore, training activities and operational readiness milestones were integrated into the master schedule as key milestone events.

#### Conclusion

Considering the complexity of the DSN and the interdependencies that exist between the various subsystems and complexes, the incorporation of an Integrated Master Schedule, a rigid change control process, and a schedule oversight group was a worthy effort. A result of this activity's success is an effort to instantiate a permanent Master Schedule that will integrate milestones across all of the DSMS organizations. This new scheduling system will provide the integrity required to plan with confidence to meet our current and future commitments.