Establishing a Multi-Mission Control Team

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At the Jet Propulsion Laboratory, the current mission control teams are responsible for the health and safety of the spacecraft, transmitting commands to the spacecraft, real-time coordination of Deep Space Network support and ground data system issues, and monitoring of spacecraft events. There is one mission control team per project, each providing very similar support using project specific procedures.

A Multi-Mission Control Team is not a new idea. In fact, such a team existed from November 1992 until May of 1995 at JPL. The projects that were supported were Magellan, Voyager 1, and Voyager 2. Mars Observer was evaluating the benefits of using this Multi-Mission Control Team when their mission ended abruptly. Although the multi-mission team was providing excellent support to the projects, there were a number of areas where improvement was needed. The cost model was poorly defined. The processes, interfaces and procedures were never engineered to support all the projects in the same way. The ground data system was unique to each project.

Since the idea of one team supporting multiple spacecraft was a new concept, it was a tough sell to new projects and the only missions that joined were those that could not afford a full mission control team. In today's climate of many low cost missions, individual projects cannot each afford to maintain an experienced mission control team. Some Projects have opted not to have real-time mission control team support during planned quiet periods, and accept any support outages and notification delays that may result.

Funding is needed to seed the development of a multi-project real-time support team, to provide support for these low cost missions. A core team needs to be put into place to assess all current projects. This core team will look at the expected future mission set to engineer the processes necessary for providing real-time mission control support using a standard method. A mission support area needs to be built. The ground data system needs to be configured in such a way as to allow a user to log into any of the team's workstations and bring it up to support any one of the missions. A standard set of operational interfaces and procedures need to be identified. Finally, a standard costing model needs to be established and clearly documented.

A team of twelve engineers would be the initial team which supported all the new small missions. This would allow for two people performing real-time support twenty four hours a day, seven days a week. In addition, two other individuals are needed to oversee the teams operations, assist with critical activities, and ensure that the team knows each spacecraft's activities and priorities. Once the Multi-Project Real-Time Support Team is established, its cost would be spread across all the projects which the team supports.

Once the team is established, there are many areas for future growth. This team could be rotated through a specific project's test-bed activities and assist with the running of spacecraft software tests. The team could take on the real-time data management role. Since the team is familiar with the Ground Data System, they could support computer adaptation tasks for projects, and assist in the development of new software applications.