

**Abstract for Submission to  
SpaceOps 2000 Theme 1:  
Mission Planning and Management**

Title: "Team Z," A Rapid Reaction Approach to Mission Operations System Design and Costing

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A mission operations system (MOS) comprises a host of functions in a variety of disciplines, including telecommunications, orbit determination, spacecraft and ground system evaluation, data processing, data transport, mission design, event sequencing, facility and spacecraft scheduling, and test and integration. Combining these into a system design has typically been a sequential process. Multiple iterations are required as uncertainties and conflicts are slowly discovered in the combinatorial numbers that result from multiple interfaces. This approach demonstrably produces good designs and accurate cost estimates, but it is inherently slow and expensive. With proposal and mission activity at an all time high, the sequential process begins to break down, becoming a bottleneck to efficient planning.

The Telecommunications and Mission Operations Directorate (TMOD) of NASA's Jet Propulsion Laboratory (JPL) is adopting a collaborative approach to MOS design and costing. Called "Team Z," this approach is potentially applicable to all phases of a mission, from formulation to operations, but has been tested thus far on proposal efforts only. An extensive questionnaire has been developed which is given to the client project or proposal team prior to a Team Z session. The client delivers the questionnaire to the team for members' individual evaluation. Then the team and the client meet for two to three hours in JPL's Project Design Center (PDC), a room equipped with software and hardware tools that enable efficient collaboration. The joint session allows questions of clarification by both parties and proceeds to examine the operations concept in a detail appropriate to the project's development phase. Costing is done in real time, allowing the client and the team to consider the effects of options and tradeoffs. A draft report is completed by the end of the session. Within days the final report is prepared, vetted and delivered to the client, embodying a commitment by TMOD. The team works rapidly, costs accurately, and finds greater opportunity to identify and perform cost-effective tradeoffs.

This paper describes the team, its purpose, process, tools, status, and plans.