

## MARS PATHFINDER STATUS AT LAUNCH

Anthony J. Spear  
Mars Pathfinder Project Manager  
Jet Propulsion Laboratory  
California Institute Technology  
4800 Oak Grove Drive, M/S 230-235  
Pasadena, California 91109-8099  
Tel: 818-393-7868 Fax: 393-1227  
E-Mail: anthony.j.spear@jpl.nasa.gov

### Abstract

Mars Pathfinder is the second of NASA's "cheaper, better, faster" Discovery missions, the first, the Near Earth Asteroid Rendezvous (NEAR) mission, was launched on February 17, 1996 to tag up with Eros in February 1999.

Under a development cost cap<sup>1</sup> of \$171 M, the Pathfinder challenge is to land on Mars on July 4, 1997, 38 months after project start, to image its surroundings, take weather measurements and deploy a rover the size of a "breadbasket" for surface engineering mobility tests, science measurements against rocks and close-up imaging of the surface. The primary mission durations for the rover and lander are one week and one month respectively. However, there is nothing to preclude longer operations up to one year.

Pathfinder is in a special, "cheaper, better, faster" project operating mode at JPL, accomplishing a challenging mission on a quick reaction schedule, at low cost and fixed price, using a "Kelly Johnson"-like skunkworks approach, focusing on a limited set of objectives, streamlining project approaches, using a cost-effective balance of available and new technology, exploiting the existing deep space infrastructure at JPL, and minimizing bureaucratic red tape. NASA's Office of Space Science is developing Pathfinder. The Advanced Concepts and Technology Office teamed with the Space Science Office is developing the Pathfinder rover. Pathfinder is being performed at JPL in its in-house, flight system build mode.

Space projects under tight cost and schedule constraints must not take "short cuts" in certain critical project implementation steps, just the opposite, these steps must be emphasized even more.

Some of these critical steps are:

1. Technical, cost and schedule planning
2. Technical, cost and schedule monitoring and control
3. Risk assessment and mitigation

Risk has two elements: programmatic and mission which are highly interrelated. Over-emphasis on staying within the budget could jeopardize mission success, and in today's environment, it is not acceptable to overrun cost caps.

In addition, with NASA's breaking up the available US space \$ pie into many small missions, avoiding all eggs in one basket, there is no excuse for taking undue programmatic or mission risk on any one small mission.

**Then how does a project manager proceed with what appears to be a rather highly constrained project implementation challenge: accomplishing a significant mission, under tight cost and schedule constraints, while not failing?**

This paper and the symposium talk summarizes the Pathfinder project approach to this question—what is working well and what about the approach that needs further work—and provides a status update on Pathfinder's readiness for launch, its 7 month cruise to Mars and its Mars surface landing.

<sup>1</sup>For development of the flight system excluding the rover (\$25M), Delta launch vehicle (\$54M) and flight operations (\$14 M).