
NASA's Faster, Better, Cheaper

Dr. Noel W. Hinners

Dr. Noel Hinners is vice president of Flight Systems at Lockheed Martin in Denver, having left NASA in 1989 as Associate Deputy Administrator and Chief Scientist. Earlier he served as NASA Associate Administrator for Space Science, Director of the Smithsonian's National Air and Space Museum and then Director of the Goddard Space Flight Center.

He asks, "NASA's Faster, Better, Cheaper: Useful New Paradigm or Path to Disaster?" Either way, it is risky.

The Mars Global Surveyor, with the Mars Pathfinder, was Lockheed Martin's first FBC project. Pressure to perform is great, and a 5% cost overrun triggers a review or possible cancellation. Reviews, inspections and redundancies have to be reduced, but if performance proves good, the company has a good chance for FBC missions in 2001, 2003 and 2005.

Hinners contrasted the program manager's environment in the past and now. In the past, cost overruns were forgiven if there was mission success, but today cost is an independent variable. In the past, failures were an integral part of experience, but now failure is increasingly unacceptable and/or "unavailable," out of the question. In the past, the program manager exercised significant authority, but today that authority is constrained by bureaucracy and leadership of the Integrated Product Development team. In the past, program managers developed systems experience through career development opportunities, but today many engineers are pigeonholed with little or no flexibility. In the past, program managers had greater trade space for redundancy as well as cost, mass, technology and schedule. Today, however, the PM is boxed in on all sides with cost, mass, LV and schedule. Finally, now a project is based on performance based contracting while in the past it was requirements driven. "Its a tougher job now," Hinners noted.

On the positive side, FBC is the "path to success." It is THE way of life for NASA and thus Flight Systems, the FBC leader at Lockheed Martin Astronautics. Their Product Development Organization was set up for FBC; however, this does not always make things go easy. FBC challenges the way they do business, in which design-to-cost is a must. Teamwork and risk management are paramount, but an unexcelled workforce is the key to making it work. "Mantra aside," he notes, "mission success is still what counts."

On the negative side, FBC can potentially lead to science that is uninspiring or trivial, in which case both scientists and the public may lose interest. The higher risks path can result in "too many" failures, but no one seems to know how many is too many, and there is still a low political tolerance for any failure. The new starts "numbers game" may get us one or two missions a year regardless of size. A poor technology plan could lead to the wrong technology investment plan, wrong choices and few applications. Finally, FBC can burn out our engineers with pressure to succeed and excessive overtime. Some engineers, for example, routinely spent 70 to 80 hours a week on Clementine and Pathfinder.

Hinners identified four required engineering skills that need to be emphasized by today's engineers:

1. Teamwork. "The Lone Ranger is dead," he notes, but "Integrated Product Teams are alive."
2. Communication. All engineers need to know how to write and speak clearly and accurately.
3. Business. "As a NASA engineer I couldn't care less if a TRW made a respectable profit or not," he admits, but in industry you must focus on ROI, ROE, profit, loss and debt ratio. Also, the global economy suggests more international cooperation and collaboration.

4. Intuition. Besides being a world expert and having a “systems sense,” engineers need “brown envelope talents.” Continuing education and consulting with experts are increasingly important for mission success.

*Dr. Noel Hinnners
Lockheed Martin Astronautics
P.O. Box 179 MS S8001
Denver, CO 80201
(303) 971-1581
noel.w.hinnners@den.mmc.com*

“We build trust by taking responsibility,” Hinnners said, “and with mission success.”