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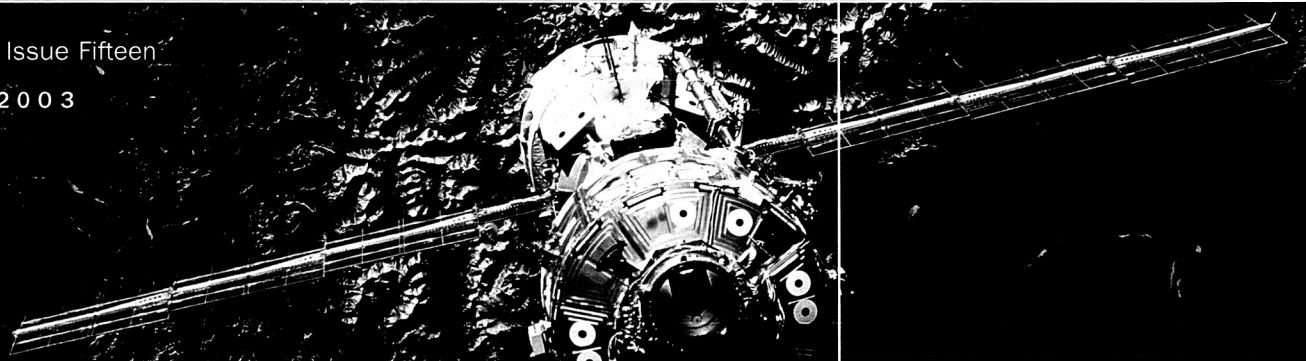
INTERVIEW

Dennis Grounds



ASK Magazine • Issue Fifteen

DECEMBER 2003



Inside

GETTING CAREER SAVVY
THE POWER OF NETWORKING
PROFILES IN COURAGE
A DEDICATION TO STS-107



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WELCOME TO THE ACADEMY OF PROGRAM AND PROJECT Leadership (APPL) and *ASK Magazine*. APPL helps NASA managers and project teams accomplish today's missions and meet tomorrow's challenges by providing performance enhancement services and tools, supporting career development programs, sponsoring knowledge sharing events and publications, and creating opportunities for project management collaboration with universities, professional associations, industry partners, and other government agencies.

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Please direct all inquiries about *ASK Magazine* editorial policy to Todd Post, EduTech Ltd., 8455 Colesville Rd., Suite 930, Silver Spring, MD 20910, (301) 585-1030; or email to tpost@edutechltd.com.

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Oh, Develop

Stories in ASK Magazine demonstrate that career development is rarely something successful project managers consider just a phase of their career

IN A MATURE VIEW OF THE SUBJECT, CAREER DEVELOPMENT is not simply four years of college or a week at training, culminating in a diploma or a certificate to hang on an office wall. That's why we wanted to take a broad look at career development in this issue of *ASK*. Take for example, Dr. Gerald Mulenburg's contribution, "Fly on the Wall." When Mulenburg and other members of a knowledge-sharing group at Ames were invited to observe an upcoming project review, Mulenburg thought it would be interesting to learn how another project does its reviews.

Note that Mulenburg is no "fresh out" who's never attended a NASA project review. Not only has he been through a fair share of them as the reviewed, he has also been on the other side of the table as a reviewer. This experienced project manager recognizes that at any stage of a career there is room to grow and develop one's repertoire.

Too often people associate career development with textbooks and rote classroom training, far removed from project life. But classroom training need not be like this, as you'll find in our Special Feature, "The Enterprise Project" by Wendy Dolci, which sprung out of an APPL Advanced Project Management class in July 2003 at Ames Research Center.

In addition to Dolci, some of her classmates contribute to the story. Mike Sander of the Jet Propulsion Laboratory, project manager for the Mars Science Laboratory mission, who provided the assignment on which the story is based, also has a cameo in the story. We think Dolci's story is an inspiring example of what classroom training can be if it's approached imaginatively and made to serve a practical purpose.

Another story from Ames, by Frank Larsen, takes a different twist on career development. At the annual

Experimental Aircraft Association Fly-in in Oshkosh, Wisconsin, Larsen represented Ames at a NASA booth. While there, Larsen met a colleague from Glenn Research Center.

Months later on a project with a quick turnaround, he remembered his colleague from Glenn who had equipment that might help Larsen save time and money on his project. Although they had never worked together and they had to unravel a lot of red tape before they could collaborate, they managed a way to get the job done.

That's the fun part of the story, but we think "Staying on the Lookout" also depicts the unassuming relationship between serendipity and career development. Much the way it does in Tom Young's story, "Class Act," when the opportunity to go back to school coincided with Young's working for a manager enlightened enough to value the personal development of team members.

There are other stories in this issue that deal directly with this theme of career development. Then there are others in which it is less explicit. But if you take the view that career development happens all the time, and is as necessary to your survival as breathing, then you can read almost any story in *ASK* with your career development in mind. In that case, all the best, and so then—start developing. •



REVIEW BOARD

JOHN BRUNSON of the Marshall Space Flight Center is a member of the NASA Program Management Council Working Group. He served as project manager for three separate microgravity payloads that flew on various Spacelab missions. His career in the space industry began in 1980 as a technician working on the first Space Shuttle.



DR. MICHELLE COLLINS works in the Spaceport Engineering & Technology Research Group at Kennedy Space Center. She has over twenty years experience in aerospace spanning engineering, R&D and project management. She is on the Florida Tech Engineering Accreditation Board, the National Fire Protection Association's Technical Committee for Halon Alternatives, and the United Nations Environmental Programme Halon Technical Options Committee.



HECTOR DELGADO is Division Chief of Process Tools and Techniques in the Safety, Health and Independent Assessment Directorate at the Kennedy Space Center. In 1995, he served as Senior Technical Staff to the NASA Chief Engineer at NASA Headquarters in Washington, D.C. He has received many honors and awards including the Exceptional Service Medal, Silver Snoopy Award, and various achievement awards.



DR. OWEN GADEKEN is a Professor of Engineering Management at the Defense Acquisition University where he has taught Department of Defense program and project managers for over twenty years. He retired last year from the Air Force Reserve as a Colonel and Senior Reservist at the Air Force Office of Scientific Research. He is a frequent speaker at project management conferences and symposia.



DR. MICHAEL HECHT has been with NASA since 1982 at the Jet Propulsion Laboratory (JPL). He is project manager and a co-investigator for the Mars Environmental Compatibility Assessment (MECA). In his previous assignment with NASA's New Millennium Program, he was instrumental in defining the "microlander" that was adopted as NASA's New Millennium Program Deep Space 2.



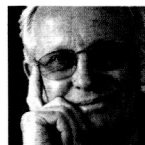
JODY ZALL KUSEK is a Senior Evaluation Officer at the World Bank. She is currently involved in supporting the efforts of seven governments to move to a focus of performance-based management. She has spent many years in the area of public sector reform, serving the Vice President of the United States, the U.S. Secretary of the Interior, and the U.S. Secretary of Energy in the areas of Strategic Planning and Performance Management.



DONALD MARGOLIES of the Goddard Space Flight Center was Project Manager for the Advanced Composition Explorer (ACE) mission, launched in 1997 and still operating successfully. He received the NASA Medal for Outstanding Leadership for his work on ACE and a NASA Exceptional Service Medal for the Active Magnetospheric Particle Tracer Explorers (AMPTE) mission.



DR. GERALD MULENBURG is the Manager of the Aeronautics and Spaceflight Hardware Development Division at the NASA Ames Research Center. He has project management experience in airborne, spaceflight, and ground research projects with the Air Force, industry, and NASA. He also served as Executive Director of the California Math Science Task Force and as Assistant Director of the Lawrence Hall of Science.



JOAN SALUTE is the Associate Director of Aerospace at Ames Research Center. She has managed many NASA projects including those involving flight testing of thermal protection materials, commercial technology, commercial applications of remote sensing, and remote sensing science projects. She has been at Ames for twenty years, and was awarded the Sloan Fellowship to attend Stanford Graduate School of Business.



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HUGH WOODWARD is a Program Manager for Global Business Services with the Procter & Gamble Company. He served as the Chairman of the Project Management Institute (PMI) for consecutive terms in 2000 and 2001. He was elected to the Board of Directors in 1996, and before being elected as the chair, served terms as vice chair and in several other key leadership roles.





So, Do You Feel Lucky, Punk?

The start of my career at NASA was largely based on serendipity

AS A GRADUATE STUDENT AT COLUMBIA UNIVERSITY, one afternoon I decided to ask my advisor, Warner Burke, for help in finding an internship. I was aware of the connections Warner had with British Airways and Citibank, and I was hoping he could steer me towards one of them. As it turned out, he mentioned that NASA Headquarters was looking for a COOP student to work on a joint research project. Before I knew it, I was in Washington, D.C., working at NASA. All this without career planning, a resume, or an interview.

While at Headquarters, I was invited to the 1983 training officers' conference. I drove there with the Goddard Training Officer, and at the end of the three-hour ride, he indicated an interest in bringing me to Goddard should anything open up. Two years later I got a call and started working at Goddard in January of 1986. Once again, I wasn't sure how events played out, but I knew that luck and meeting the right people at the right time provided a major assist.

Several years later, opportunity knocked again when I was asked to apply for an agency position as assistant to the head of the Program Project Management Initiative (precursor to NASA APPL). The position represented a significant departure from my previous work, and it took me some time to decide to apply. Eventually, I decided that I wanted the job.

Once again, fate appeared to be on my side: I was selected for the job.

In all of these critical career events, the role of people, timing, circumstance, and serendipity superceded more formal career planning and development. People have always been there for me at the right time. I am, therefore, a big proponent of the power of the network.

So does it all come down to dumb luck, or blind fate?

It is simple to ascribe meeting the right people at the right time to luck. In each of the previous situations, however, I was prepared to take advantage of the opportunity presented to me.

In every situation I encountered, my academic background was an advantage. In addition, I have been fortunate that my work experiences have been both visible and valued. When visibility and value intersect, it creates opportunity and a halo effect.

As I ponder the role of luck in my professional progression, I am reminded of the line from *Dirty Harry*, when Clint Eastwood says, "You've got to ask yourself one question...Do I feel lucky? Well, do ya punk?" With twenty years of work to reflect on, I guess I do feel lucky.

But another quote comes to mind, as well—this one from the world of baseball. Branch Rickey once said, "Luck is the residue of design." The way I see it, luck is only as good as the preparation that goes into it. •

People have always been there for me at the right time. I am, therefore, a big proponent of the power of the network.

CLASS ACT

BY TOM YOUNG

IN 1971, I WAS WORKING ON THE *VIKING* PROGRAM WHEN my center director, Ed Cortright, recommended that I accept an offer to become an MIT Sloan Fellow. I certainly considered it a flattering offer—but the timing couldn't have been worse. We were in the preliminary design phase for *Viking*, and I didn't see how it was possible for me to leave the project at that point.

Actually, on *Viking* all phases of the project were critical. It was NASA's first mission to soft-land a spacecraft on Mars, and we understood the opportunity we had, coming only six years after landing on the moon.

The project manager was a gentleman by the name of Jim Martin. He not only displayed an extraordinary amount of discipline in his own work, he required it of the people who worked for him. He understood that the way you get in trouble is by cutting corners, and he was committed to excellence. He lived it, and he pushed it every day. It's fair to say that he was known as a demanding manager.

I had been selected by Jim to be one of a handful of critical people on the project. When I got the call from Ed, I was in the middle of establishing relationships with all the scientists. I couldn't imagine that Jim would let me go without a fight.

But that's when he taught me something about leadership that I have never forgotten. Though it was going to cause difficulties for his project, Jim encouraged me to take the Sloan fellowship. He agreed with Ed that it was too good an opportunity for me to pass up, and it would be too important a step in my career not to take. Jim might be demanding of the people working for him, but he cared an awful lot about them, and he was willing to make sacrifices to invest in them. That's what I learned.

When Jim told me I should take the Sloan fellowship, I wasn't about to argue with him. But I told him that when I finished at MIT I wanted to come back to *Viking*.

"You're welcome back," he told me. But he also made it clear that I wouldn't be entitled to anything other than the opportunity to return to the project and work hard—in whatever position he needed filled at the time.

This story so far has been about Jim Martin and *Viking*, but I also want to say something about career development. When an opportunity comes up, whether it is to go to Sloan or to attend one of the APPL classes at Wallops Island, I would urge any project manager, or aspiring project manager, to consider the value that training offers not just to them, but also to their

He not only displayed an extraordinary amount of discipline in his own work, he required it of the people who worked for him.



In essence, what they told me was, “Look, this stuff you’re doing now is important, but so is preparing for your future.”

projects—and to the Agency, in giving young leaders the chance to develop.

Sloan did many things for me. One, I was exposed to academic subjects that were new to me. Before going to MIT, my expertise was all technical; through the Sloan program I had the opportunity to study business and management, and to see another side of project work. Even more important than that, it was an enormous confidence-builder for me. It gave me the personal self-confidence to do things that I don’t think I would have done without that experience.

I was an engineer who had worked almost my whole career at NASA. In my classes, I met people from all the major industries, and also from several foreign countries. When I went to MIT, I had no idea if I would be able to hang in there with the likes of them. To my delight, I found out that I could.

When I returned from Sloan a year later, I was ready to give back to NASA and I returned to the *Viking* program. I wasn’t treated special for having gone to MIT, but Jim put me in a position that he thought was right for me—and, eventually, he gave me even more responsibility than I had when I left. I stayed until the

end of the project. *Viking* launched in 1975, and the history books tell the story of our accomplishments better than I can.

After *Viking*, I went to NASA Headquarters as director of the Planetary Program. I went from there to the Ames Research Center, where I was appointed deputy director, and then on to the Goddard Space Flight Center, where I became center director. I left NASA in 1982 to join Martin Marietta, where I eventually was appointed president and chief operating officer.

The Sloan experience was critical to what I did afterwards, but so was having worked for people like Jim Martin and Ed Cortright, who realized the importance of developing young people to be leaders. In essence, what they told me was, “Look, this stuff you’re doing now is important, but so is preparing yourself for the future.”

That’s another thing I learned from Jim. Real leaders understand that if they make decisions that are in the best interest of their employees’ careers, then everyone benefits. Certainly, the individuals involved have more opportunities. But project managers also gain; they get a more qualified workforce, and they earn a reputation for being managers who good people want to work for.

Jim Martin certainly influenced me by helping me to understand that the development of people is a critical responsibility of any leader. Because he was willing to invest in my future, I stretched myself to do things that I might not have had the confidence or the courage to do on my own. •

LESSONS

- Good managers do not stand in the way of employee advancement and development. In fact, they encourage it.
- Project success often depends on having the right people in the right roles. Competition for the “right” people is stronger now than ever, and a project manager who wants to recruit strong teams should establish a reputation as someone who takes care of people.

QUESTION

When you have offers to join more than one project team, what are your considerations when deciding which offer to accept?



After earning a Masters of Management degree from the Massachusetts Institute of Technology, **TOM YOUNG** returned to NASA, and earned the Agency’s highest award, the Distinguished Service Medal, for his role as

mission director on the *Viking* project.

He went on to receive the Outstanding Leadership Medal for his contributions to the *Voyager* program, the Meritorious Executive Presidential Rank Award, and the Distinguished Executive Award. He finished his career as Executive Vice President of Lockheed Martin Corporation.

“I’m trying to be retired now,” says Young, though his resume might not concur. Since “retiring” in 1995, Young has served on several boards of directors and chaired reviews of NASA’s Mars and International Space Station programs, as well as DoD’s space program.



WOULD *YOU* RAISE YOUR HAND?

BY DR. OWEN GADEKEN

THE SCENE WAS ALL TOO FAMILIAR TO ME: A NEW LEADER WITH A NEW PROJECT. GONE WERE MY DAYS AS A MANAGER ON AIR FORCE MISSILE DEVELOPMENT PROJECTS. I HAD JUST JOINED THE FACULTY AT DEFENSE SYSTEMS MANAGEMENT COLLEGE TO TEACH PROJECT MANAGEMENT. NOW WE HAD A NEW COMMANDANT, AN AIR FORCE BRIGADIER GENERAL WHO WAS OUT TO REVOLUTIONIZE OUR CAPSTONE PROJECT MANAGEMENT COURSE.

IN DUE FASHION, HE ASSEMBLED HIS PROJECT TEAM OF faculty and staff and announced he had a “new vision” for project management training in the Department of Defense. We would create a new course with a single evolving project as a central theme. We would cover the entire project life cycle using a series of case studies based on this single project. Further, we would construct the new course as a “living project” so that student decisions could be incorporated to change the scenario as it evolved. This ability to adjust the case “on the fly” would allow students to actually see the impact of their early decisions on project outcomes.

MY INSTANT REACTION WAS, “SURE, HE’S INTERESTED IN FEEDBACK — AS LONG AS IT SUPPORTS HIS IDEA.”

As he went on, I remember saying to myself, “What an innovative concept, but it will never work in our system.” We had up to 300 students going through the course at a time. If each student group were allowed to adjust the scenario as they went along, we would have an enormous configuration management problem.

Also, the bulk of our cases studies came from real world projects where we had actual cost, schedule, and performance data. Where would we get the data to feed to each group as they departed from the baseline scenario? Our faculty prided themselves on meticulous preparation before teaching each case study. What type of faculty would it take to respond to this constantly changing scenario? A set of “negative fantasies” raced through my mind if we were to adopt the commandant’s new approach.

After concluding with a comment about how this would revolutionize our educational process, the commandant said he was interested in our candid feedback on his proposal. My instant reaction was, “Sure, he’s interested in feedback—as long as it supports his idea.” Having been through situations like this many times before, I resolved to keep my mouth shut and was certain my colleagues would do likewise. Even if the vision proved futile, which was highly likely in my opinion, we would just wait a couple years for the next commandant to rotate in with another vision.

So I anticipated the usual prolonged and uncomfortable silence followed by a politically correct question or two. But this was not to be as my colleague Don, who had convinced me to change jobs and come to the college, raised his hand and stood up to speak from the

back of the room. “Sir, with all due respect, your vision won’t work. I admire the concept, but it is too complex for our students and faculty to execute.”

I knew Don was thinking this, but I couldn’t believe he was saying it publicly. I lapsed briefly into another negative fantasy. Perhaps the commandant would let Don stay on for a few months before he terminated his faculty appointment (all faculty were on excepted service term appointments). Or maybe he would just reassign him to one of our new regional “outposts.”

After giving Don time to outline the reasons to support his position, the commandant responded immediately. He surprised us all by praising Don for his courage in voicing an opinion counter to his vision. The general went on to say that he encouraged people to state their honest opinions even if they were not in agreement with his or other senior leadership positions.

Even after this statement by the commandant, many of us continued to expect negative fallout from Don’s challenge to the general’s vision. But it never came. Don kept his viewpoint, his job, and actually became the commandant’s favorite “lightening rod” for candid feedback on any new proposals.

And the commandant’s vision? It never came to be, either. We worked hard on it and had some success in our pilot offering. But, in the end, Don was right. It was too complex for both faculty and students to execute. So we gradually moved back to enhancing our current course offering.

Ironically, there were several positive repercussions from this experience. Don’s “free to speak your mind” example was not lost on the organization. Other faculty and staff gradually felt more empowered to speak up and offer their candid views about on-going projects.

Even though the commandant’s vision ultimately failed, we learned a great deal from the experience that was incorporated as improvements to our existing project management courses. We also kept the spirit of experimentation and allowance for failure alive and well at the college. We continued to try new approaches. Even if they didn’t succeed, we always learned valuable lessons from the process.

And the commandant? He gave the vision his “best shot” and after the normal two-year tour, retired, moved to Colorado, finished his doctorate, and embarked on a new career as an independent consultant.

As I think back on this incident, it stands out clearly as one of the “tipping points” in my career in project management training. While it seemed like an almost

trivial event at the time, it reinforced the value of praising rather than "shooting the messenger." I found myself using this same approach on teams I led with equally successful results. •

LESSONS

- Even the most trivial event can influence the climate and ultimately the results on a project.
- Being able to speak freely without repercussion is an important element in any team or project.
- Sometimes our negative fantasies keep us from making positive contributions to our team or project.

QUESTION

In light of evidence that suggests cultural change is rarely accomplished strictly by executive fiat, what can we do to cultivate an environment in which speaking up is rewarded, not silenced?

HE ENCOURAGED PEOPLE TO STATE THEIR HONEST OPINIONS EVEN IF THEY WERE NOT IN AGREEMENT WITH SENIOR LEADERSHIP POSITIONS.



FROM THE ASK ARCHIVES

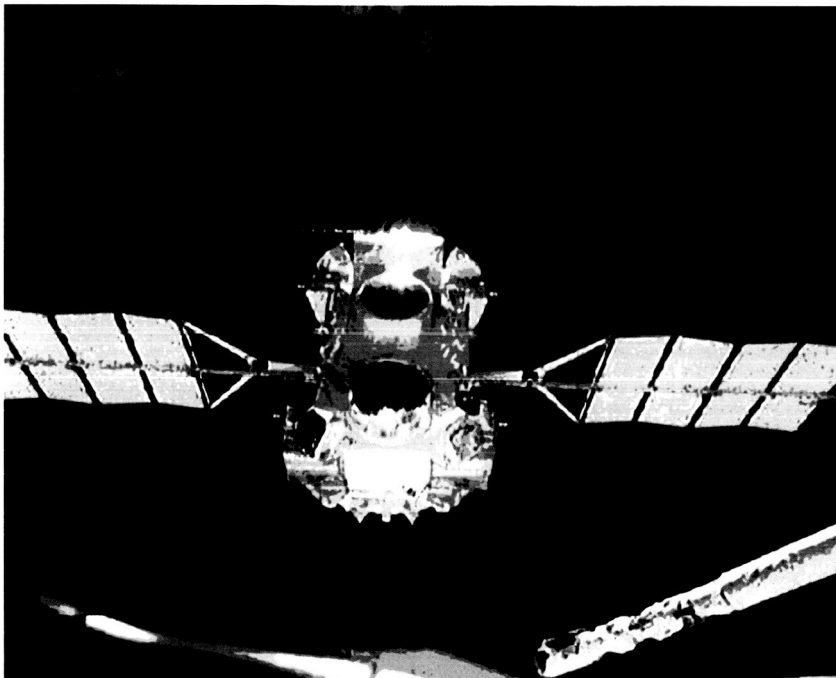
In addition to serving on the ASK Review Board, **DR. OWEN GADEKEN** has published a practice in Issue 2 and stories in Issues 7 and 11. In his practice, "Cross-Training within the Project Team," Gadeken discussed the "internal conflicts" across functional organizations that hamper project work: "What happens is that team members form stereotypes and make snap judgments about what their colleagues are doing and why. To prevent this kind of conflict from undermining the project, I believe it is helpful to set up short cross-functional training sessions that allow project team members to explain the key elements of their job to the other members of the project team. The intent of these sessions is to: (1) establish closer cross-functional working relationships among project team members; (2) identify dysfunctional gaps and overlaps between team members; (3) raise the general level of project knowledge among team members; and (4) raise the level of trust and openness among all project team members."



**A GOOD
MAN OF FIN
IS HARD**

by marty davis

EVERY PROJECT HAS ITS STORIES. THE ONES WE USUALLY WANT TO tell are the outright success stories—but the ones we also need to hear are the “things we did wrong and should have known better.” The Compton Gamma-Ray Observatory (CGRO) was the heaviest astrophysical payload ever flown at the time of its launch in April 1991. Working on CGRO, we accumulated our fair share of that second breed of story. I’ll share a few of them here:



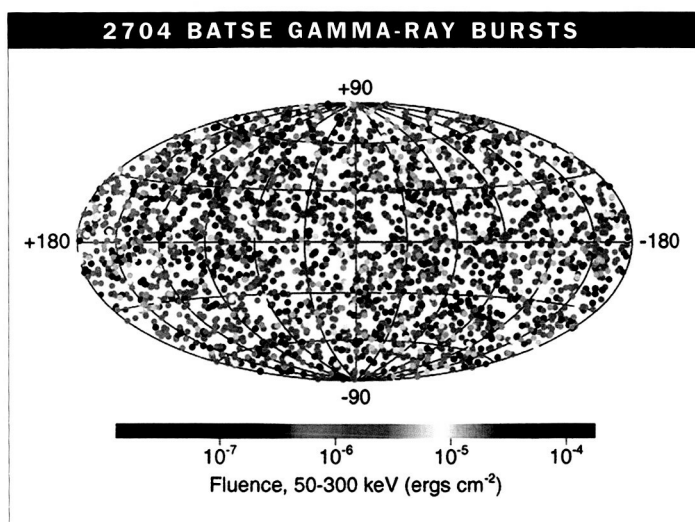
The one-person syndrome

The Energetic Gamma Ray Experiment Telescope used light pipes to measure time-of-flight. These were simple pieces of plastic, bent and glued together, and this appeared to be an easy task to accomplish. The catch here is that the task *appeared* easy.

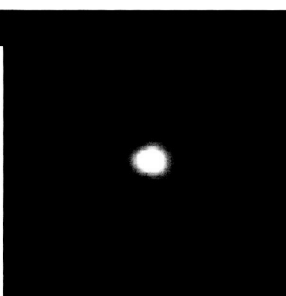
It was known to the engineers that only one person had been able to complete this task successfully so that the light pipes worked optimally. Unfortunately, this man was about to retire, and an attempt to procure the light pipes from another source failed. Only by appealing to the man to save the project and the Center's reputation did he agree to hold off his retirement to finish the work and to train a replacement.

It was much the same way when it came to a contractor who made the photomultiplier tubes for the science instruments and who used only one of their assemblers to make the tubes. The specifications were

The stories we usually want to tell are the outright success stories—but the ones we also need to hear are the “things we did wrong and should have known better.”



Above: The Burst and Transient Source Experiment (BATSE) records a radioactive emission in space. **Right:** The Energetic Gamma Ray Experiment Telescope (EGRET) captures an image of Earth's moon.



appear to be, pay careful attention to the situation so that you know that one person will be there when you need him or her most.

One-person depth

One-person depth is not the same as “only one person can do it.” The problem here is the assignment of complex systems to only one team member—a situation often necessitated by budget constraints, but one that adds risk to a project.

For example, on CGRO the design of the digital electronics for the COMPTEL instrument was a one-person effort. The system was ahead of schedule. The prototype was finished and had undergone preliminary tests ahead of schedule. Everything sounds wonderful, right?

But then the engineer was offered a better job. He gave notice, and left the project. No one else was familiar with the system and how the changes identified from testing should be made. This led to six months of long days and weekend work for team members who had to fill in.

The mechanical design of the Energetic Gamma Ray Experiment Telescope (EGRET) was another one-person job. Sadly, the design engineer died during the build of the mechanical engineering test model. The engineer we hired to replace him had to hit the ground running; he had to finish the build, and move right on to testing.

Though the documentation was in good order, the new design engineer never got the chance to study the design in detail and get familiar with the work that had been completed by the first engineer. Tests indicated that

quite rigid, and the one assembler who knew how to make the tubes had a success rate of just 40 percent.

CGRO needed more tubes and this one man was on vacation. The project office put pressure on the contractor to keep the production line working. The contractor reluctantly agreed.

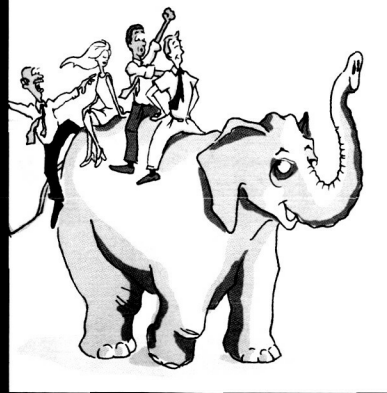
Ten tubes were pushed through the manufacturing process and the yield was zero. What the one man did working at an identical station with identical parts is not known, but CGRO lost time and the contractor lost money. They informed us that from then on we should wait until their one man was available. We agreed.

What do these cases say to a manager? Project life is rarely as simple as it seems. Make sure you find out how difficult the work is—and if told only one person can do the job, no matter how “trivial” that work might

Pulling stories out of the trunk

Making the front page of *The New York Times* is every program's dream, right? Except we were, oh, 300 percent over budget, and without a prayer of reaching our technical goals. Nobody was working on solutions; everybody was pointing fingers and taking cover.

Into one of our meetings one morning walks a new manager on the program who says, "I just saw in the paper this morning that somebody has brought an elephant into town, and they're offering rides."



Everybody else looks around the room, thinking, "Well, what has this got to do with anything?" And then the manager says to the other senior managers around the table, "Okay, you, you, you, and I are going to go over there, and we're going to ride this elephant."

And there was great protesting. It seemed crazy. But, in the end, they went down the street a couple of

blocks and rode this elephant. Believe it or not, from that point on, they started to cooperate a lot better. It's hard to argue with somebody that you've just been hanging onto on the back of an elephant—especially when there are pictures.

That came straight from the playbook of none other than Mr. Marty Davis. It was brilliant. What that little story reminds me is that you've got to do goofy things sometimes to get people to start working together. And, as we've all learned, people working together is the only way to get out of a mess.

—Larry Goshorn, former Vice President of ITT Industries

changes had to be made. This resulted in a series of change and test, change and test. In the meantime, the replacement engineer decided to retire. The EGRET instrument was finished but there was an uncomfortable, lingering feeling that no one knew the design in depth.

One-of-a-kind solutions

What can we learn from these stories? In cases like these, a manager should estimate how many of the systems on a project are one-person affairs. He or she should then try to keep some reserve resources to cover lost personnel. A team member lost late during system development may require that two to three people come on board to pick up the work, which normally means that one of the experienced persons on the project must be one of those chosen to do part of the work. Filling one void may require shifting a lot of responsibilities.

There may be no way out of this situation since having two people from the start adds too much cost. What to do is simple, albeit no guarantee of a solution: Make certain there is adequate paperwork for someone to see what has been done, what is left to do, and how and what to do next.

Despite these problems, CGRO was graced by having a project manager who believed in the abilities of his people, who projected a "can do" attitude, and who generated enthusiasm for the project. In that sense, no effort was truly a "one-person" effort. Because we

believed in what we were doing, we pitched in when the time came and, in the end, the project was generally regarded as a resounding success. •

LESSONS

- Project managers need to identify in advance those critical tasks for which they don't have sufficient overlap or redundancy in their work force.
- In positions that are "one-person" jobs, the project manager copes through a combination of documenting as much as possible, providing opportunities for team members to share their knowledge, and fostering a sense of shared responsibility on the team.

QUESTION

As a project manager how do you allow individuals the satisfaction that comes from making unique contributions to the team at the same time that you protect the team against being too dependent on any one individual?



MARTY DAVIS is the Program Manager of the Geostationary Operational Environmental Satellite (GOES) at the NASA Goddard Space Flight Center in Greenbelt, Maryland. The recipient of many honors, he received NASA's highest award, the Distinguished Service Medal, in 1995. He has worked at NASA since 1962.

Staying on the Lookout

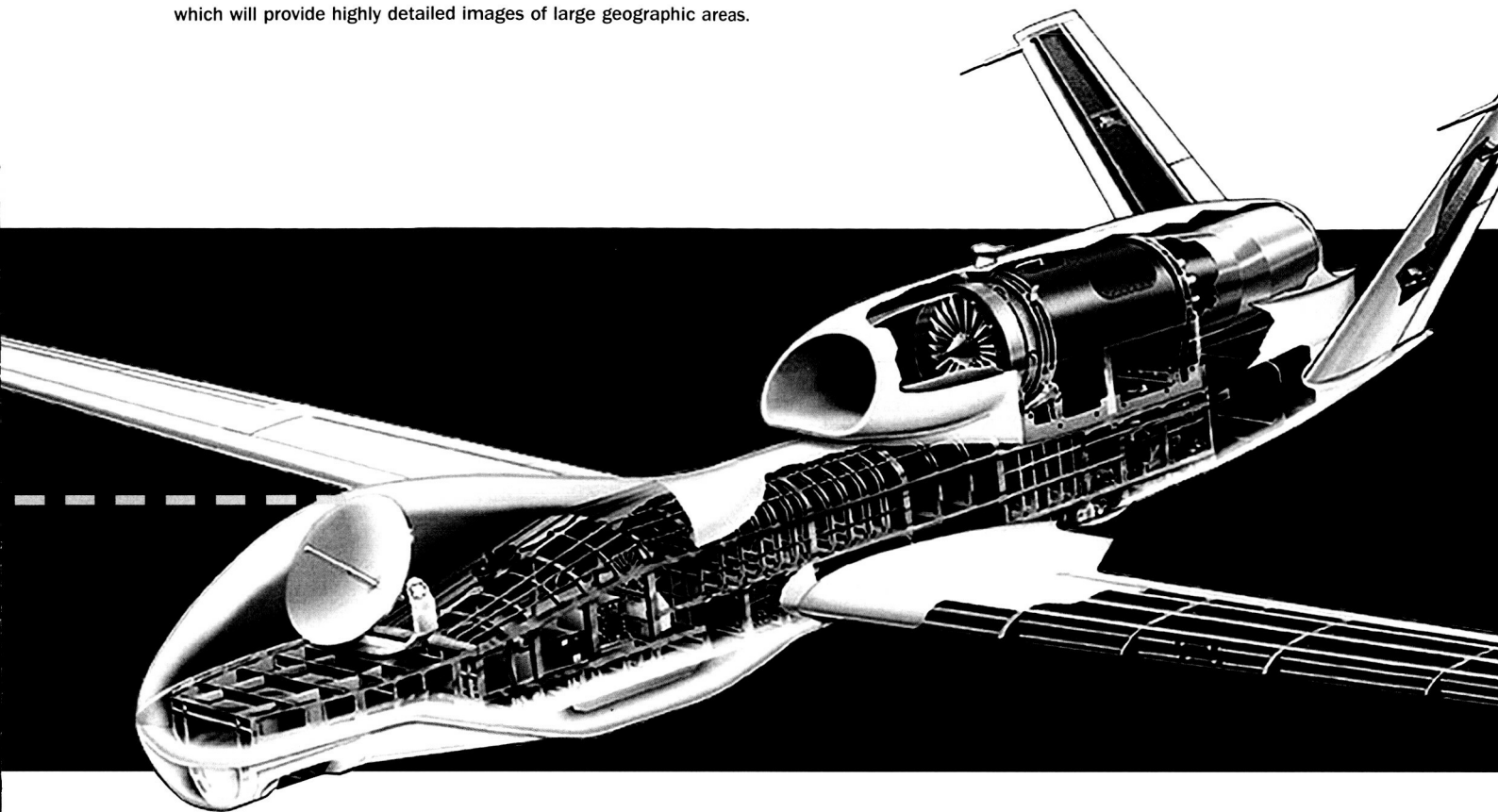


THE EXPERIMENTAL AIRCRAFT ASSOCIATION (EAA) AirVENTURE in Oshkosh, Wisconsin, is one of the biggest aircraft shows in the world, and it is also a huge public relations event for NASA.

I was there in 1999 representing Ames Research Center. It was my first time at Oshkosh, and I was thrilled to be there. I'd heard about the show for years, how popular it is with the public, and all the amazing things that you can see there. Research aircraft, future aircraft, old aircraft—just about anything you can imagine in aviation is there. Even inflatable wings!

NASA likes to show off some of the things we've done historically in aeronautics, as well as some of the things we're doing now and are planning for the future. Craftsmen from some of the NASA Centers shared a table in one building. My background is in manufacturing, but I work now as a liaison between manufacturing and designers, helping designers see their ideas realized. But I was a craftsman for a long time, so I went there with a display about the history of manufacturing at Ames, and felt right at home being part of the craftsman display.

A cross sectional view of the *Global Hawk* unmanned security aircraft, which will provide highly detailed images of large geographic areas.



I'd never met any of these guys before, but we hit it off immediately and started talking. It was clear that we were all excited about the work we were doing back at our Centers. For instance, I learned from Steve Nevins of Langley that he had equipment for rapid prototyping that I didn't have at Ames, especially the stereolithography capability, and I was like a kid again listening to my dad show me what he had in his tool box.

A few months after I got back from Oshkosh, a project came along to build landing gear, and the customer needed it done quickly for an acoustic wind tunnel test. The shape of the gear was so complicated that the only way to do this quickly was to build the mock-up gear with stereolithography tools, and that's when I thought back to my meeting with Steve Nevins at Oshkosh.

I had never worked with another fabricator from another NASA Center. To be honest, I didn't know if there was a way for me to use his services.

I called Steve up, and we talked about the project. He told me to send him some computer drawing files electronically so that he could see what I was talking about. I sent the files over the Internet and while we were on the phone, he started asking questions about

my requirements, such as how thick the walls needed to be, etc.

Not long after our phone conversation, he came back with how long it would take him and how much material he would need—and it was about one-third the cost of what I would have to pay at home, in Silicon Valley where Ames is located. To me it seemed like a no-brainer. Why pay to use a vendor's equipment when we (NASA) have it already?

But there was still a problem of how to get Steve to do the work for me. I started looking into it and people said it wasn't easy to exchange monies between Centers. For instance, hourly labor rates differ from Center to Center based on cost-of-living adjustments, and all that had to be figured in, too. It would seem simple, but it never is.

I needed to get the parts made as soon as possible to satisfy my customer. Finally, I said to Steve, "How about if I just pay you in replacement stereolithography material?"

He said, "Hey, that would be great with me." And so, that's what I did.

I didn't pay for his labor directly, but I supplemented his labor costs by buying additional material

that he could use later. I got what I needed at one-third of what it was going cost me to use an outside vendor. Plus, I was keeping him busy with interesting and challenging work. He got to put his machine to work making my complex parts.

routine and I was able to tap into that to put Steve to work on my projects.

I shake my head every time I think about the irony. No matter what I knew or didn't know about the Fabrication Alliance, had I not met Steve at Oshkosh I'd

probably never have benefited from his expertise and ability to help me. Nor would NASA, for that matter. Here we were all working for the same Agency, doing much the same kind of work, and it was a public relations event of all things where we finally got the chance to meet and learn about one another's work.

It just goes to show the variety of ways in which we can forge fruitful working relationships, and that opportunities exist to collaborate through events we might not expect could lead to that. •



The bottom line is NASA got a better deal, and Steve and I established a working relationship that continues to this day. I've used Steve's services on at least three or four other projects.

Since that first job, I've learned that there is in fact a way that he and I can work together through something called the "NASA Fabrication Alliance," which consists of all of the fabrication divisions at NASA's ten Centers. This allows us to get things done in a smarter way. Until I was in need of something like this, I'd never heard of it. But through the Alliance this sort of collaboration between NASA Centers has become

LESSONS

- Partnerships may spring up from informal meetings with colleagues. Look at all such occasions as potential opportunities to extend your network.
- Cooperation based on a clear win-win relationship enables the development of simple, innovative, and pragmatic solutions, which in turn lead quickly to desired results.

QUESTION

What are other approaches to enabling practitioners at different NASA Centers to collaborate on projects?



AN AGENCY-WIDE ALLIANCE

FRANK LARSEN works in the Aeronautics and Space Flight Hardware Development Division in the Project Management Office at Ames Research Center, where he is responsible for managing the fabrication of multi-disciplined research projects.

The NASA Fabrication Alliance he describes here was originally comprised of the four NASA Research Centers (Ames, Dryden, Glenn, and Langley), but has expanded in recent years to include all NASA Centers. The Alliance works to strategically manage fabrication resources by sharing best practices and reducing duplication of capabilities and physical assets.

"The Fabrication Alliance is a 'One NASA' success story," says Dr. Gerald Mulenburg, a member of the Alliance's steering committee from Ames. "To transfer funds in NASA is time-consuming and difficult, and that discourages partnerships like the one Frank established informally with Steve."

Under the Fabrication Alliance, partners draw from an available pot of money, eliminating the need to cut through the red tape involved in transferring monies between Centers. According to Mulenburg, "This makes it possible to get the job done quickly, and it provides better value to NASA and the taxpayer."

dedication



by Jeanne M. Holm

The NASA Web portal we had designed was exactly what we felt that NASA management wanted: a new face for the Agency, engaging, interactive, and upbeat; a real change from the staid, informational Web site that NASA had already.

I WAS THE PROJECT MANAGER FOR THE REDESIGN. I WAS THE one who would say, “We’re going live,” who would push the button, so to speak. I felt great about what we had accomplished under an incredibly tight deadline.

On January 2, when we still had about four months to go on our schedule, we had given a presentation at Headquarters. Upper management had loved our vision for the new site; they loved it so much that they said they didn’t like our schedule and, instead of deploying the site in four months, they wanted it up and running in four weeks. We hadn’t even signed contracts with our subs yet, but we were asked to deliver the portal on February 3rd.

Launch date

Though we were in a hurry-up mode of operation, we had spent the time to find the right place for everyone on the team, so that every team member knew they could trust the people around them to do their jobs. My Jet Propulsion Laboratory (JPL) team included Douglas Hughes, Jay Dyson, Ellie Trevvarthen, and Greg Williams.

We all worked around the clock; no one took any time off. In that month, we were able to pull together a well-constructed, solid Web site. It didn’t have all the bells and whistles that it would have had over the four-month development time, but we had a plan for adding in all those bells and whistles eventually.

The team decided to launch the new portal on a Friday night, January 31st, just before midnight here in California—traditionally a slow time for the Web. Though the Shuttle was scheduled to land the next morning and we knew the public would look to the site for information, we would be able to give the site a test run before most people saw it.

We invited friends from around the world to join us as we logged on. When the Web site came up on our computers the music we built into the splash page started. On the telecom, every couple of minutes we heard the music start in the different remote locations. We would ask, “Which country was that?” And the answer would come back: “Oh, this is Panama.” “It’s Calgary.” “It’s France.”

We all had been working 16-to-20-hour days for weeks. Many of us—myself included—were about ready to collapse, but it was still a celebratory moment for us. Most of the team was online until about 2 a.m., and then I sent everyone home for a well-deserved rest.

But we didn’t rest for long. A few hours later I got a call at home. It was someone at NASA Headquarters



who told me, “We’ve lost the Shuttle.” I was asleep when the phone rang. It was early in the morning, and I was so tired that it took me a moment to understand what I had just heard. And then it hit me: *Columbia* was gone.

Then and now

I can’t help but compare the whole experience to the last Shuttle tragedy, and contrast it with the helplessness I felt then.

In 1986, I was working on the *Voyager* project at the JPL, and we were gearing up for a planetary encounter. We had all sorts of press folks there in the room with us because planetary encounters come few and far between. We had the NASA TV on in the background and were all watching the *Challenger* launch. When we



From left to right:

Columbia crew members David Brown, Rick Husband, Laurel Clark, Kalpana Chawla, Michael Anderson, William McCool, Ilan Ramon

lost *Challenger*, there was just this stunned silence and disbelief. It was the longest time before anybody could admit what had happened.

The team I was on during *Challenger* wasn't directly involved in the manned missions, and we had no official role in helping the Agency through the crisis. Because we didn't know what we could do to make a difference, we felt a sense of complete helplessness.

This time, with *Columbia*, I felt the team I was leading, in our own small way, could do something to help.

Pulling together

I knew immediately that we would need to make changes on the Web site. The way we designed the site was completely inappropriate for the incredibly tragic

event unfolding. Our flashy rock-n-roll intro showed, of all things, a Shuttle flowing through the sky. I knew immediately that it had to come off the site, as soon as possible. And I knew that we would need to prepare for an onslaught of traffic; like us, the rest of the world would be looking to NASA for answers.

Driving back to the office, I got on my cell phone and called my leads on the project at eTouch and Critical Mass, explaining to them, "I know you're exhausted, but we need to get back to work. We've got to make the site appropriate for the moment."

By the time I had gotten into the office, which was only about fifteen minutes away, the team had come back to me with a new proposal for how they could, within the next hour or so, bring together a Web site that



would reflect what we were struggling with at that moment as an Agency and as a Nation. The team may have been tired from the marathon of getting the site online, but they reconvened instantly for this new dash.

On the fly that Saturday morning we completely redesigned the interface to the site. We developed new graphics and started posting new *Columbia* contents, including posting warnings about staying away from the debris and informing people whom to contact if they came across any.

Instead of the 200,000 hits that we thought we would get that first weekend, we had 220 million hits from all around the world. My greatest concern was our search capability. Normally we would get about 6,000 requests a day to the NASA search engine. We had built

The team may have been tired from the marathon of getting the site online, but they reconvened instantly for this new dash.

the initial deployment to handle about 20,000 hits a day, wanting to make certain that we had plenty of capacity. That first day we got 1.5 million search requests.

Redesigning graphics was easy. But you can't scale up a search engine on the spur of the moment. That first day, the search started to melt—it started taking half a minute, a minute, and then longer for people to get a response. This kind of load on the system was unprecedented, and it looked as though we didn't have the ability to get people to the content they wanted.

I did two things to address this problem. First, I reduced demand on the search by asking my designers to build navigation on the home page to get people immediately to *Columbia*. They created a rotating banner of a flag at half-staff that linked directly to the main *Columbia* page. People looking for content could immediately see that they could get what they were looking for by clicking on a big image at the top of their screen.

That handled a huge number of the search queries because we were directing people to where they needed to be, rather than having them get there by way of a search. But that wasn't enough. Many searches from our site were still timing out. I needed to enhance our capacity—and I needed to do it immediately.

Because we had been pushing so hard on the site, I think I knew the home phone numbers for every NASA



Webmaster. I called two people who ran other large search engines for Agency sites, Scott Glasser and Jeff Cobb. I asked, "Hey guys, can we offload some of our hits to you?" They were still doing fine because they weren't the primary search engines for NASA, and they agreed.

One of the search engines had actually been scaling back, in anticipation of the new portal capabilities. They had already taken some of their servers offline and boxed them up. In no time at all, they went into the office and put the servers back online.

By mid-morning, when our search function required too long a response time (more than 45 seconds), we programmed the site to bring up a message directing users to the two other NASA sites. Together, we were able to successfully handle all requests through the three search capabilities.

We wanted to make certain that the site stayed up, functioning optimally, so that the folks who were trying to communicate what was happening at the Agency

could say, "If you need some information, go to www.nasa.gov." If we could demonstrate that we could handle the unprecedented traffic, then they would have a tool they knew they could use.

None of us left the office for two days, making sure that the folks who were posting information about *Columbia* had all the support they needed, and making sure that the press conferences were streamed online.

Our team played a small role compared to so many others, but I am immensely proud of their dedication, and it made me realize, yet again, that NASA is not just America's space agency. Those weren't just our astronauts; those were the world's astronauts. Through the Web, the world could mourn their loss together. •

LESSONS

- Under conditions of uncertainty and tight deadlines, one important capability of project teams is quick adaptability.
- Building a cohesive team upfront is always crucial to project success—but when a quick response is required, cohesive teamwork becomes even more important.

QUESTION

How do you prepare your team to cope with surprises?



In addition to her role as project manager of the NASA portal, **JEANNE M. HOLM** is Chief Knowledge Architect at the Jet Propulsion Laboratory, and she leads the NASA Knowledge Management team. In June of 2003, she received an International Competia Award for Competitive Intelligence. Holm and four other award winners were selected from a pool of over 110 international candidates, representing the top professionals in the fields of Competitive Intelligence and Strategic Planning worldwide.

In recognition of her achievement, the judges cited Holm's background in publishing scientific and technical information and creating distributed information systems, as well as her "clear, concise and simple approach, which facilitates buy-in." For NASA this means helping practitioners share knowledge and act upon information in ways that will measurably improve the performance of NASA and its partners.



The Long Journey

by W. Scott Cameron

EARLY IN MY CAREER I WORKED WITH AN EXPERIENCED, highly regarded design engineer who continually stated he would change assignments or companies for a nickel-an-hour salary increase.

I thought this a strange comment, as a nickel an hour didn't seem significant enough to warrant changing jobs, but I was young and hadn't really given much thought to my career path. When I finally asked him about his statement, he explained he was trying to teach me to understand and master my unique set of talents and

manager that if she were offered the job she would only accept it on a reduced work schedule basis. She didn't like my idea, as others had told her the hiring manager considered all the listed job criteria "musts," and if she were offered a full-time job she would have to take it.

She reluctantly decided to try my concept and bid on a full-time assignment she felt was right for her career. During her interview the hiring manager indicated she had the correct skill set for the assignment. He believed that she was the correct person for the job

In analyzing people's careers I ask them to define and write down one to three things they must have in an assignment, and as many wants as they wish.

capabilities. This way I could leverage them throughout my career to obtain the best assignments or offers.

Thus, he taught me the need to become a recognized master in what I did. As I made career choices over the years, I came to realize that this advice is what drives me to deliver or exceed my customers' expectations. If I can't do that, then the value of my services diminishes and my negotiation space shrinks on future assignments.

Other mentors would influence my career development, but this engineer's advice, as well as my own learning, has become the main source I draw from when talking to engineers of all career levels.

What do you (really) need?

When I coach and mentor people regarding their career aspirations, one of the areas we discuss in great detail is the short- and long-term "musts" and "wants." In analyzing people's careers I ask them to define and write down one to three things they must have in an assignment, and as many wants as they wish.

We then compare their list to the must and wants of potential assignments to see if there is a match. This has become an interesting and revealing exercise as I see people begin to clarify what is of vital importance to them (a must) and what are they willing to negotiate to get a new assignment (a want).

I was recently working assignment planning with a subordinate and was engaged in the must/want discussion. She indicated her primary must was that she had to have a reduced work schedule assignment. She indicated she was having a hard time finding one. I suggested she apply for a full-time assignment. If after the interview she felt she could do the work on a reduced work schedule, then she should explain to the hiring

and he wanted to offer it to her. She then negotiated with him to accept the job, but as a reduced work assignment. The manager indicated he had never thought about the assignment in this way but agreed to her condition/must. Thus, the hiring manager's perceived must was really a want, and there was more room to negotiate the assignment than she had originally perceived.

Do as I say

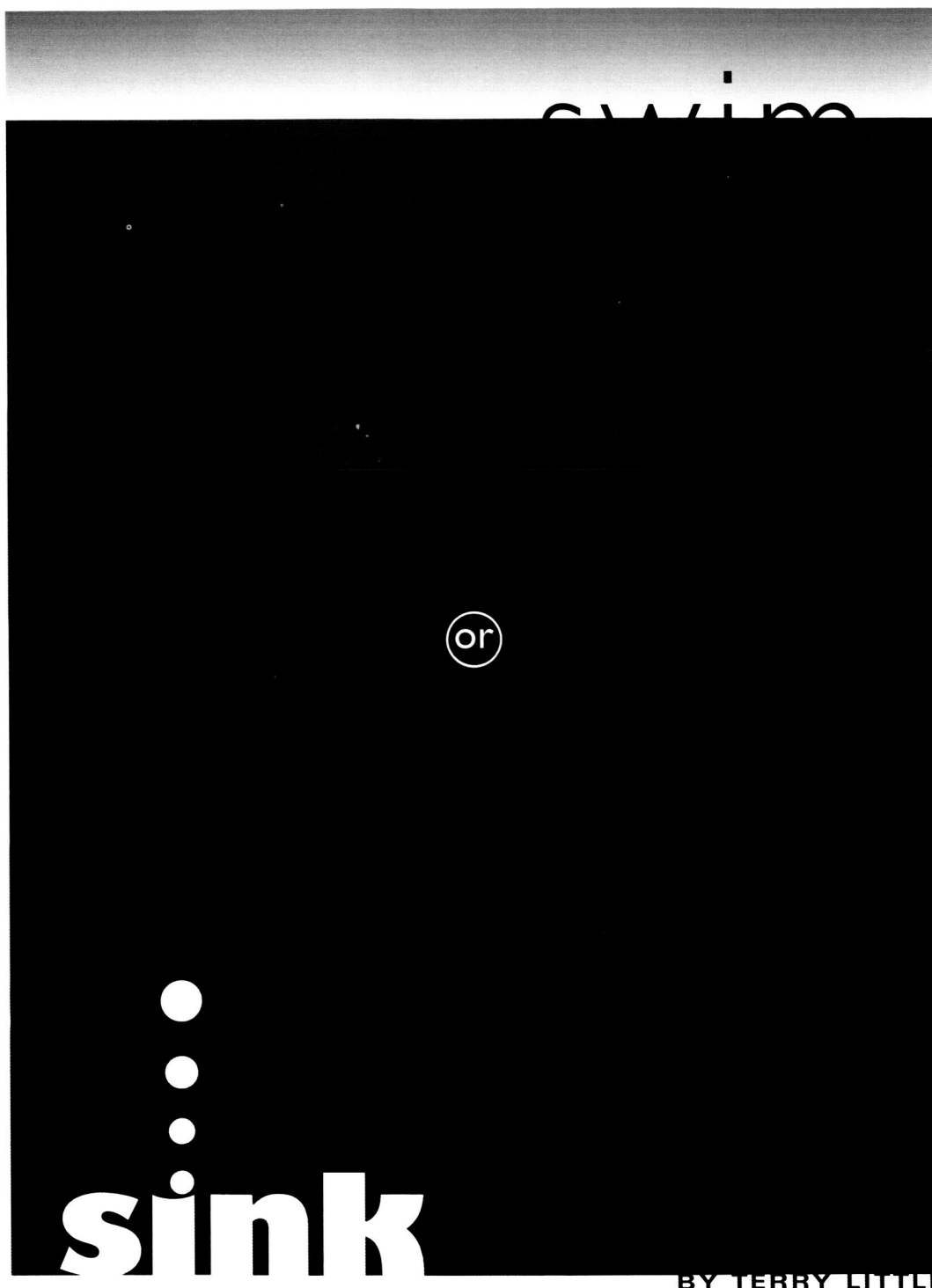
Sometimes, as managers, mentors, and coaches, we need to re-examine our career "musts" and "wants," and the actions we're taking to achieve them.

I was discussing career coaching with another manager not that long ago, and we talked about our approaches to coaching people regarding assignment planning. We learned that our coaching patterns were similar. And, as the conversation progressed, we discovered we were also both looking for new assignments—but not following any of the advice we were giving to others on how to manage their careers or obtain new assignments. After a long pause in our conversation, we agreed it was time to walk our talk, and follow our own advice.

Career development by definition is a long journey. As we help shape the careers of others, it does us no good to forget that our own careers will continue to develop—whether we take charge of them, or let others shape our future. •



W. SCOTT CAMERON is the Capital Systems Manager for the Food & Beverage Global Business Unit of Procter & Gamble. He is also a regular contributor to *ASK Magazine*.



THE TRADITIONAL VIEW OF CAREER DEVELOPMENT IN THE government goes something like this: Start your career as a functional apprentice. Become a functional expert over time by exhibiting "technical leadership" (whatever that means). Over time, seek out positions of increasingly greater responsibility with corresponding job titles. Make a gradual transition from a specialty focus to a managerial focus.

Along the way submit to some vaccinations such as getting a Masters or PhD degree, attending some prestige courses, accepting a Headquarters assignment, and working at two or more field locations. Show some significant persistence and heaps of personal sacrifice. Avoid the big mistake. Burn no bridges.

We have the perfect model for career development, right? Senior Executive Service is virtually in the bag. Not quite. In fact, what we have is the perfect formula for a federal bureaucrat: great resume, no beef.

I propose an alternate approach that I call "sink or swim." Let me illustrate with a story. Lorene worked for me as a program manager. She was about 50 and had begun her career as a secretary, gradually working her way up to a GS-13; she had been a GS-13 about ten years even though she had filled all the squares for promotion. I liked her work. She was a better-than-average manager, but admitted to being intimidated by engineers because she didn't have "a technical degree."

Confronted with any technical issue she would invariably defer to the judgment of a government engineer, even when she understood the technical issue well enough to develop her own conviction. The unfortunate byproduct was that her program usually had cost and schedule difficulty because she was always pushing to reduce risk and develop the optimum solution.

One day she came to me and said that she was going to have to find another job. She told me that her husband had prostate cancer and that she wanted to spend more time with him. She said she couldn't

continue to travel extensively. After thinking about the situation I suggested to her that she become my financial manager. I knew she was well-organized, disciplined, and caring—traits my financial manager at the time lacked. She would also not have to travel in that job. She demurred, declaring, "I don't have a financial background. I will get you into trouble."

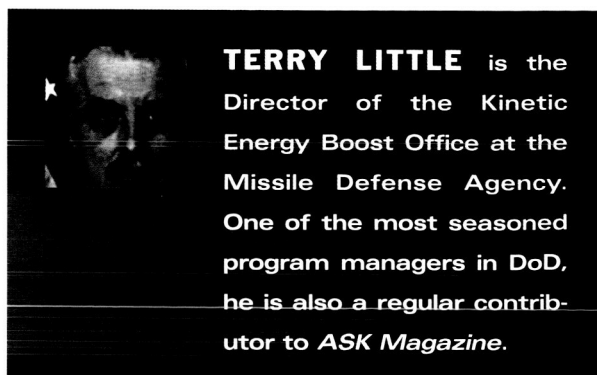
I listened. When she finished, I told her that she was going into that job whether she liked it or not. Her getting me into trouble would be my problem, not hers. Making a long story short, she did an absolutely superb job turning

the entire financial management operation around in less than six months. I was able to get her promoted to GS-14 and later supported her for a program manager position in another organization as a GS-15. She again excelled. I have since lost track of her, but have heard that she was recently promoted to the Senior Executive Service.

How did all this happen? Basically she jumped (or more properly, allowed herself to be pushed) into water that was way over her head. She could have drowned, but she didn't. It was an enormous

personal and career risk for her, but she came up a swimmer—a powerful, purposeful swimmer. The normal career development path is one that never leads to getting into water over our heads. But, wading comfortably around doesn't produce swimmers. •

The normal career development path is one that never leads to getting into water over our heads.



TERRY LITTLE is the Director of the Kinetic Energy Boost Office at the Missile Defense Agency. One of the most seasoned program managers in DoD, he is also a regular contributor to *ASK Magazine*.

● **In July**, the **Academy of Program and Project Leadership (APPL)** conducted a two-week class in **Advanced Project Management** at Ames Research Center. In the heart of Silicon Valley, Ames is known as one of NASA's strongest Centers in software development and information technology. To take advantage of these local resources, course manager John Newcomb structured the class with a specific focus on managing complex software projects.

Included in each Advanced Project Management class is a practicum, otherwise known as the Enterprise project assignment. The students are asked to solve an ongoing problem faced by one of NASA's project teams. In this case, Newcomb invited the Mars Science Laboratory (MSL) mission, managed by Mike Sander of the Jet Propulsion Laboratory, to use the Enterprise project as an opportunity to address a problem facing MSL. "We're rapidly coming up on our concept review," Sander stated. "Getting a firm handle on the technology development plan for MSL is very much of an issue."

Sander, and his deputy Rich Doyle, came up with the following problem for the class: *To create a workflow process, description, and test case that identifies, selects, matures, and integrates new software with existing software to create flight code for MSL.* Integral to the assignment, class members, who represented seven of the ten NASA Centers as well as Headquarters, had to make certain to address costs, schedule, and risk constraints.

THE ENTERPRISE PROJECT

BY WENDY DOLCI



IT FELT AS THOUGH WE WERE GETTING NOWHERE THAT FIRST night as we tried to discuss the problem. We were twenty-three people thrown together in a room, without a leader, and we didn't have anything to go on beyond what we had heard from Mike Sander.

Finally, the class agreed on two things that we needed to accomplish immediately: One was to define the problem; the other was to define a process for accomplishing the task we had been given.

We broke up into groups. In my group it was total chaos. Eventually, we managed to define the problem, but we completely failed to come up with any kind of process for getting things done. At that point, I started thinking that we only had three more nights to work on this. How would we get anywhere if we didn't even have a process?

When we regrouped as a class, it turned out that we had all come up with similar definitions of the problem, but the processes were all over the map. It took us at least another hour to agree on the wording of a mission statement, and then we couldn't come to any agreement about what came next. I started to say we need a leader. Nobody was listening. So I kept saying, "We need a leader."

Finally, someone said, "Well, why don't you be our leader?" It was classic. You know, I said, "We need this," and then they said, "Okay, you do it." I should have seen that coming—the old be-careful-of-what-you-ask-for scenario. We had a vote, and I became the leader.

I looked at this thing with two agendas in mind. Agenda number one was to give the class a problem, which was challenging and stimulating. Agenda number two was to see if a bright group of people might come up with some notions about how to bridge these worlds of technology development and flight system development.

We had actually been thinking about this problem for a couple of years, off and on. I thought, well look, here is an opportunity to get some bright folks who bring a lot of capability to the table. I'll explain the problem to them and see if they can offer some fresh insights and ideas.

It's a very powerful process and one that we have now already put to use in MSL in a number of different areas: getting people who haven't been in the middle of the forest, but are still very strong technically, to step in and think about the problem for a while and offer their observations.

MIKE SANDER, Jet Propulsion Laboratory

It was now my job to lead the discussion about how to proceed. It was clear to everyone that we would need to break into groups to accomplish anything. It took a while

NASA scientists and engineers demonstrate new robotic technologies that they hope to employ on the Mars Science Laboratory (MSL) at a "Marscape" test facility at Ames Research Center.

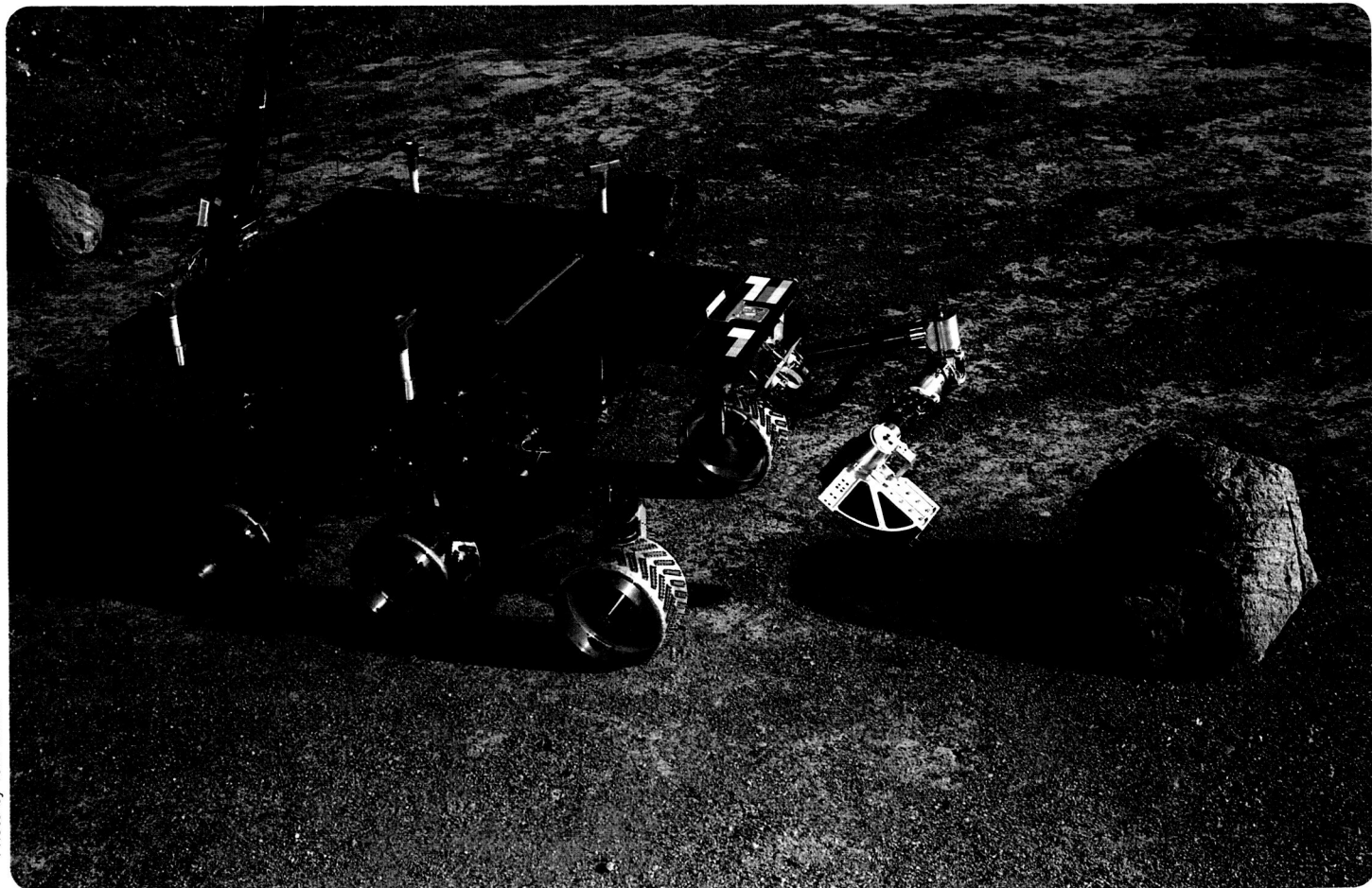
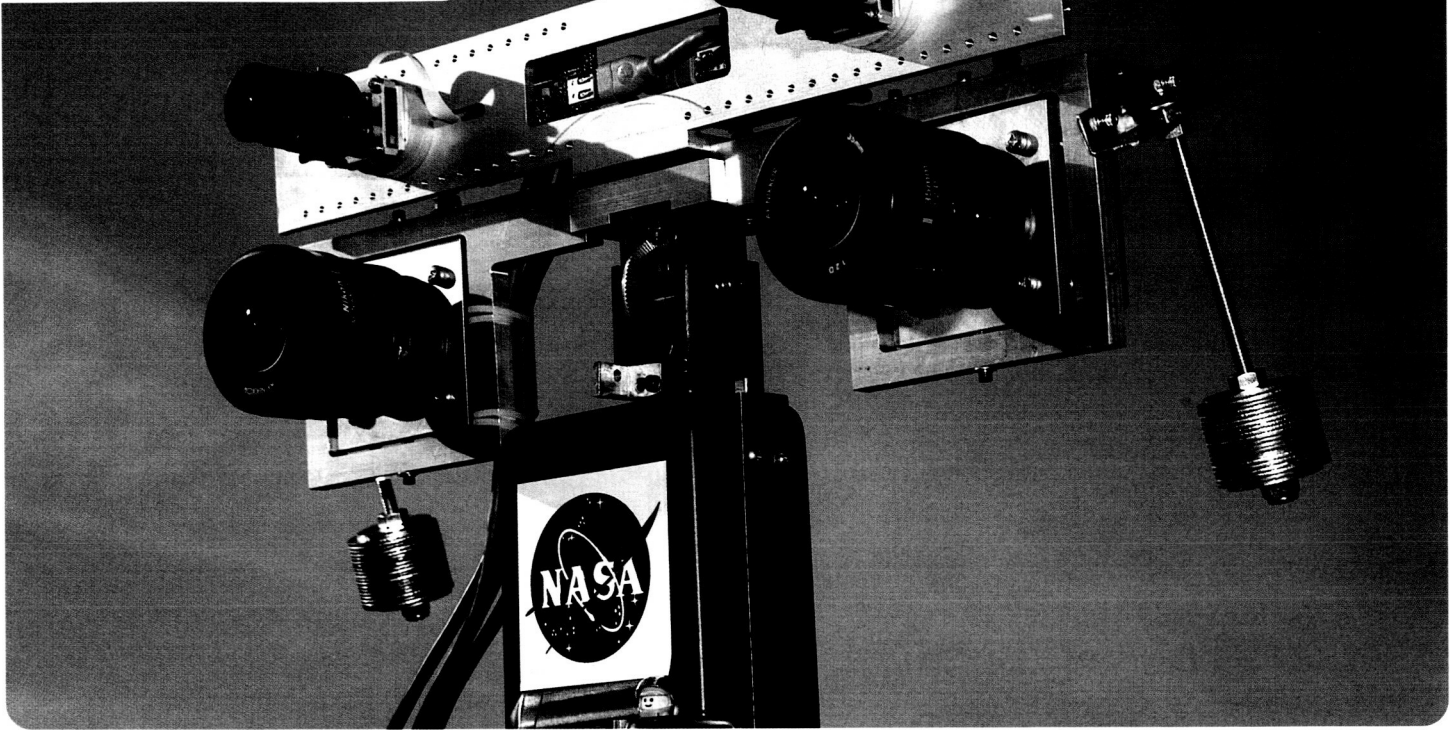


Photo by Tom Trower

but we came to the consensus that each group would work the problem and present a solution, rather than dividing up the problem into pieces. As a class we would decide which of the solutions to present to Mike Sander.

My plan was to go around the room, count off, and randomly select the three teams. It would be fast and easy. But as it turned out, there were people who felt strongly about working with other likeminded people. As a result, the class as a whole would attack the problem from different perspectives. So, we broke into teams that way.

One group that emerged said, "Yes, we can do this. It's not so hard." They were optimistic that they could put together a good workflow for the problem based on

YOU HAVE TO LISTEN TO THE INPUT OF THE TEAM, OR YOU'RE GOING TO DO THE PROJECT HARM.

their collective knowledge. It was simply a matter of identifying useful software that had already been developed and finding a way to evaluate and integrate it.

Another group that emerged said, "No, we don't think that's even been done successfully before. It's not a problem that we know how to solve at this point." They wanted to try to come up with some innovative ideas, push the envelope, and explore things that hadn't been tried before.

Then there was a third group that kind of said, "You know, you guys are making such a big deal of this. Why don't we just do it?" I called them the Nike group. It wasn't that they didn't care about working the problem; they just didn't see the point in all the philosophical discussions about approaches. They simply wanted to get to work.

We spent quite a bit of time that next night getting organized. We came up with a plan for the rest of the week's schedule, how we were going to achieve this work. On a small scale, we were seeing demonstrated many of the things being taught in the class: the value of putting in time up front to define requirements, the need for flexible leadership, the importance of team building, and more.

When it was time to divide up into teams, I joined with a group of people who, like me, felt the project assignment wasn't as easy or straightforward as other people in the class made it out to be. Almost instantly, we were dubbed "the pessimists." But I never felt that was an accurate description.

I would like to think that a more accurate name for our group was "the realists." We were simply saying that a major revamping of the mindset at NASA would need to occur to solve this problem we were handed. We didn't think the assignment was trivial or easy to do; trying to recruit autonomy knowledge from the private industry and university sectors was an extremely difficult challenge.

Everyone on our team had a software background. All of them, except for me, came from Ames—but none of them knew one another well. We got started with some brainstorming concepts that the folks from the design company, IDEO, taught us on the first day of class. I think, as a result, that we all felt comfortable sharing our ideas.

We didn't always remember to apply the rules they gave us (such as the one that says to "defer judgment"), but we did work collaboratively and courteously. Someone would draw an idea on the easel we were using, and then someone else would build on it. Before long, our ideas began to coalesce.

ROB TOAZ, Jet Propulsion Laboratory

What became immediately obvious was that we had an amazing amount of technical expertise in that room. I think that was another great lesson for me, just listening and seeing how divergent ideas that emerged from individuals strengthened the group as a whole. I saw in practice that you have to listen to the input of the team, or you're going to do the project harm.

And I also came to see that having these different perspectives grouped together, rather than randomly selecting teams, enhanced the entire exercise. For one thing, our productivity would have been much less because there would have been too much time spent saying, "I want to do it *this* way" and "Well, I want to do



Class Participants *Front* Tri Nguyen/JSC, Steve Huning/JSC, Keith Nicewarner/ARC, Oscar Brooks/KSC, Ronald Clayton/JSC, Cliff Madrid/JSC, David Richwine/DFRC, John Newcomb/Course Manager *Middle* Greg Dees/HQ, Anthony Lisotta/ARC, John Chiorini/Course Trainer, Bill Huddleston/HQ, Wendy Dolci/ARC, Rob Sherwood/JPL, Rob Toaz/JPL, Walter Schneider/MSFC, Jimmy Black/MSFC, Richard Chase/ARC, Paul Gowler/JPL *Rear* Deepak Kulkarni/ARC, Warren Smith/ARC, Joan Pallix/ARC, Greg Dorais/ARC, Jeff Gramling/GSFC, Tom Hinke/ARC, Pat Crouse/GSFC, Scott Wolf/JSC

it *that* way." The teams probably wouldn't have gotten as far as they did as fast.

As a class, we did some work to make certain that we all understood our mission, that we shared a "common vocabulary" when it came to critical terminology, and that we understood what each team was going to produce. Then, the next night, the class broke into teams and worked independently on producing our main deliverable: a workflow that described how to find existing software, integrate it with new software, and produce code.

During our last Enterprise meeting before talking to Mike, each team got up and presented their solutions. I had put together a management team and we set up selection criteria and produced an evaluation form that asked the class to rate each solution: Did the solution meet the requirements? Was the solution innovative? Was the solution feasible?

Both the "pessimist" and the "optimist" teams, as we had come to call them, came up with strong solutions, and when we tallied up the class votes, their scores were close. One rated higher in innovation, the other in feasibility. Together, they offered a balanced approach. Our plan had been to down-select to one solution, but eventually we agreed to present both.

After the three teams presented their solutions, the class voted. Though our team didn't come out on top, we ran a close second. I listened to the discussion that followed the vote as the class planned the final presentation. After a while, I raised my hand.

"Look," I said, "there's no doubt this team came up with a good approach, and they won in terms of the votes of the class. But there's obviously merit in the other presentations, and I think it's going to be more beneficial to Mike Sander and the JPL organization if we present them with more than one path they might go down."

In the end, the class agreed to present two approaches to Mike—one dealt more with the development of software, the other with how to find what applicable software was already out there.

I felt as though presenting both approaches was the right decision, and I think that Mike confirmed that the night that we delivered our solutions to him. After the first pitch, about approaches to software development, Mike sounded apprehensive.

After the second presentation, he sounded more excited. It's not that the presentation or the concept was better, but I think that he started to get a more complete picture of what we had to offer him.

He made it very clear that he understood and appreciated the value in what we had prepared—to the point that he was going to share our input with his management. His response was gratifying.

Bill Huddleston, NASA Headquarters

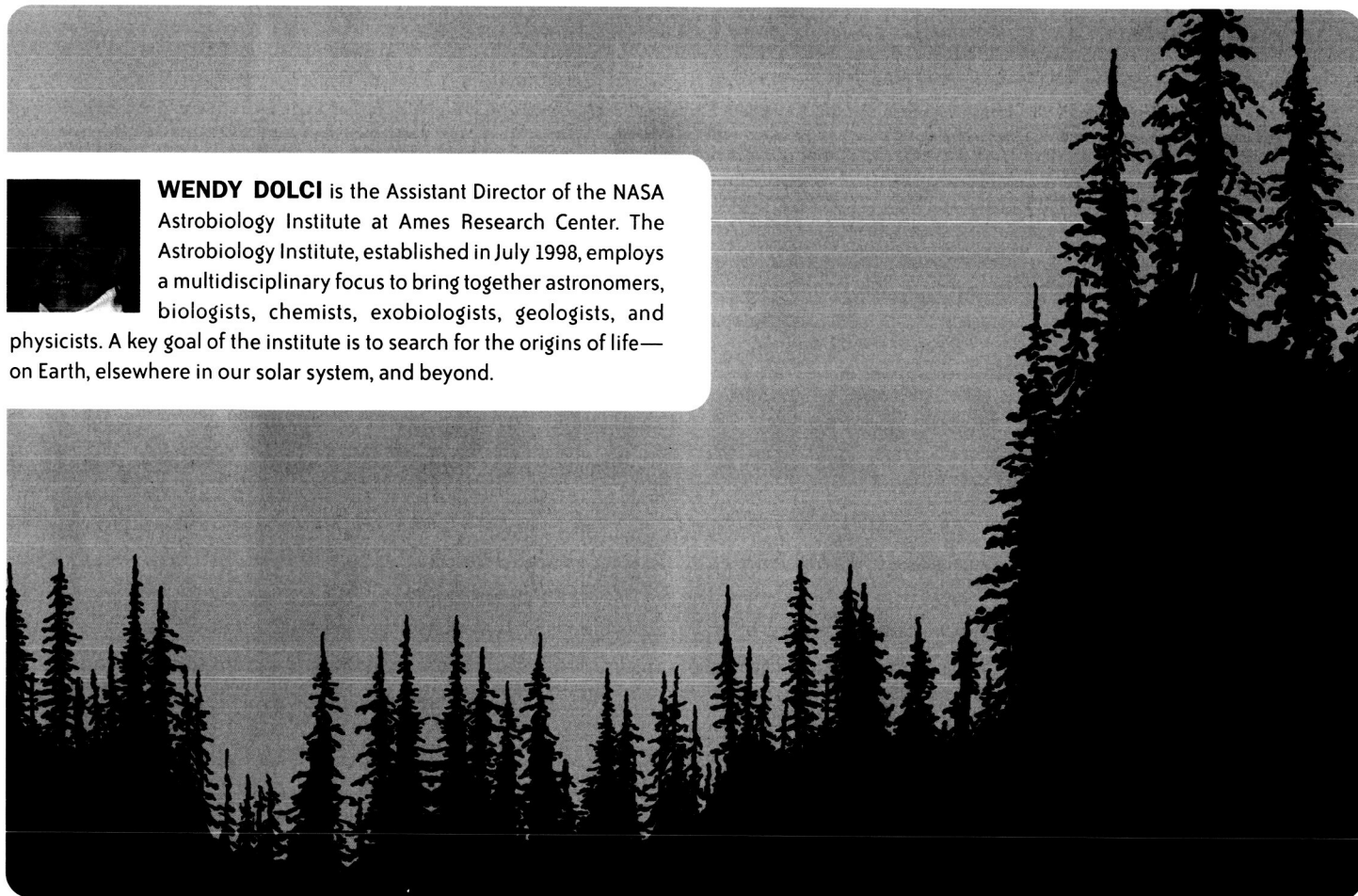
My job that last night, when we made our class presentation to Mike and to his deputy, Rich Doyle, was to summarize our work. Preparing for that summary, I became more aware of the shared concepts that the three teams had come up with, such as how to mitigate risk when dealing with flight code developed by people outside the Agency, and the importance of thinking beyond the immediate mission.

I think this was a good assignment. We got to experience an entire project from start to finish within a few days. That's an experience you don't have in NASA because our projects take a long time. They're huge. And they can be daunting, with so much at stake. Here, we had the freedom to explore the process itself and examine the roles involved. The Advanced Project Management class handed us a microcosm of a project that helped me, and I think others, to see the forest for the trees.

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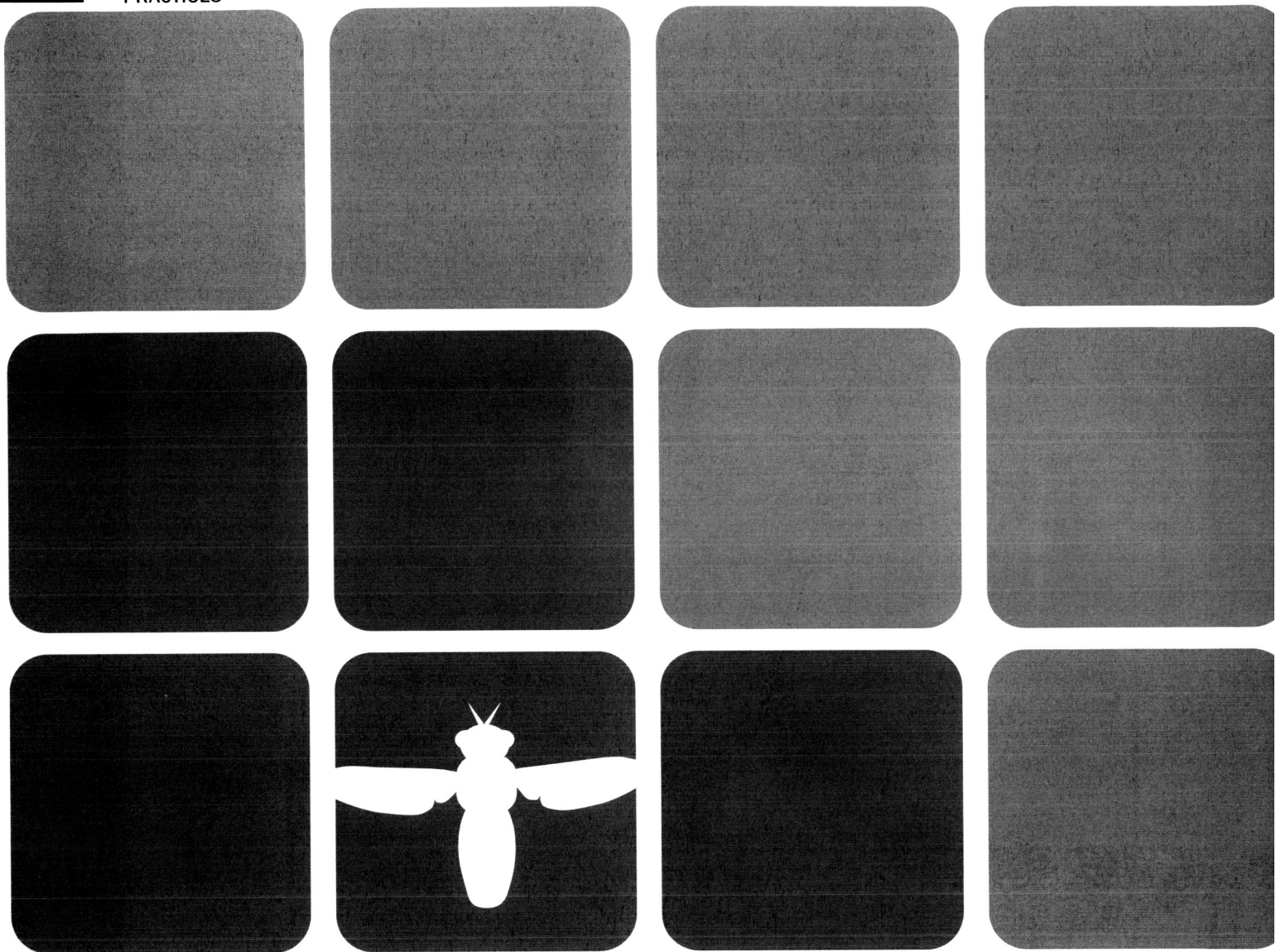


WENDY DOLCI is the Assistant Director of the NASA Astrobiology Institute at Ames Research Center. The Astrobiology Institute, established in July 1998, employs a multidisciplinary focus to bring together astronomers, biologists, chemists, exobiologists, geologists, and physicists. A key goal of the institute is to search for the origins of life—on Earth, elsewhere in our solar system, and beyond.





PRACTICES



A Fly on the Wall

BY DR. GERALD
MULENBURG

Typically, when you're being reviewed, it's difficult to see what's happening objectively.



THE EMAIL WAS ADDRESSED NOT ONLY TO ME, BUT ALSO TO all the Project Knowledge Sharing Community at Ames Research Center. We were invited to sit in on a major project review as a new experiment in knowledge sharing. This first-of-its-kind opportunity had been conceived by Claire Smith, who leads the knowledge sharing program, as well as heading up the Center's Project Leadership Development Program and serving as coordinator of the APPL-West program at Ames.

The objective was to offer Ames project practitioners the opportunity to observe project-review processes as they happen. Not that I haven't participated in my share of project reviews, but this seemed like a great way for me to get up-to-date about a new project, the Kepler mission, and to experience a review from a new perspective.

Typically, when you're being reviewed, it's difficult to see what's happening objectively—the same way it is on a project. Presenters are always thinking, "Okay, what's on my slides? How much time do I have left? What are they going to ask me?" So when Claire's email pinged on my computer, I quickly responded by asking her to save a place for me.

It was to be an informational review about progress on the project: what the team had done, where they were going, and what they needed to do to get there. There

were people on the project team from all over the United States, and it was the first time for them to get together from all aspects of the project.

For our part, as observers, we were asked to abide by a couple of rules: Don't ask any questions, and don't talk about the specifics of what we saw or heard. The idea was that we weren't supposed to be noticed. We weren't to buzz around and bother people. Hence the name for this experiment: Fly on the Wall.

I got there early because I wanted to find a seat without disturbing anyone. By the time the review got underway, there were probably about fifty people in the room. The main members of the review board were at a large table. Subject Matter Experts on the project were seated in three rows on one side of the table. Many of the people in the room never spoke. Some of them could have been observers like me, but I don't know that. I may have been the only one to observe, although I hope not. It was a remarkable experience.

Project Manager Chet Sasaki from JPL kicked off the review by introducing the Deputy Project Manager, Larry Webster from Ames, and the Principle Investigator, William Borucki, also from Ames. I was impressed right away that the meeting started on time, and then stayed on time, even finishing a little ahead of schedule for the morning session that I attended—this in spite of a lot of



discussion of the management strategies and who has what responsibility.

One thing that they did that I thought was unique was that one person at the table was appointed to be an ombudsman. His job was to cut off discussion when it was more appropriate to take a conversation off-line. In the past, I had seen people take on a role like that at reviews out of frustration, but in this case it was a designated role. This person cut off discussion several times during the meeting. This was done in a polite, professional manner, often at the request of one of the participants in the discussion, and it worked quite well. Everyone deferred to that person's judgment when it was time to move on, and that was an important reason the meeting kept on schedule.

The review was structured well, too. No fewer than eight separate functional organizations across the U.S. who have integral roles in the project attended the meeting including Mission Operations, the Science Office, Mission Management, Flight Planning Center, Flight Control Center, Science Processing Center, Data Management Center, and the Deep Space Mission System. Representatives from participating international organizations also attended.

One person ran the presentations, handling the transition from one presenter to the next, and actually taking part in the presentations. Most of the reviews that I've been involved in have been just a constant series of slides, somebody talking for awhile and then moving on to the next person, and so on, and so on. The Kepler review was much more interactive. They stopped after every presentation and said, "Okay, time for questions." Each time a question was asked, it was decided immediately whether the question was appropriate for the entire group and, on several occasions, a question was deferred to be taken up later by a relevant group. In addition, the ombudsman had to announce a couple times, "Okay, it's time to move on."

I've been in a lot of meetings where discussions have spiraled out of control and, before you know it, you're way behind schedule. These folks had their agenda down precisely. I told the facilitator afterwards how impressed I was at what they'd accomplished in the

four hours I was there and how smoothly it went. He said, "Yes, but you didn't see the pre-runs that we did before we came into the room, and the things we cut out that we felt we could do away with." So, they had done an excellent job in their preparation to make sure that everything fit in the time available.

The only thing I found that didn't work well was a minor set-up detail. They had used pushpins to hang huge sheets of paper with diagrams and information on the walls. With the seats arranged as they were along the wall, people pushed their chairs back into these charts and they started to fall down. It got to be a little annoying because it was noisy and it disturbed the people presenting, although they did their best to ignore the distraction. A couple of us grabbed a handful of additional pins and fastened down the sheets when we saw this was going to continue to be a problem.

I was under one particularly defiant chart that kept falling on me. Except for that, being a fly on the wall was a safe experience. Seriously, it provided an interesting perspective of the presentations going on and the interactions in the room. I believe Claire has hit on a simple but extremely valuable knowledge-sharing technique that can be easily duplicated with other projects at other centers.

As a matter of fact, I think it should be required that senior managers make their younger managers observe a review like this before they find themselves on the hot seat. By simply listening, there's so much to learn from what's going on. In addition, capturing some of the tips from observers and sharing them with project managers and teams across the agency might be another high-potential outcome of a Fly on the Wall.

My hat is off to the Kepler Mission team for their thoroughness, professionalism, and focus, but also for their cooperation in this helpful and important experiment. •

**I was impressed
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Some useful practices that I picked up from being an observer:

- ☐ Not introducing everyone in the room at the beginning of a meeting, but sticking to the key players at the table. Participants who gave parts of the presentation introduced themselves at that point, and others gave brief introductions when they contributed to the discussion related to their specialty. Some of these people were high-level representatives from other government agencies and participating companies who didn't seem to mind not being introduced initially.
- ☐ Clearly stating the purpose of the meeting at the beginning, and even more importantly, clearly stating what the meeting "was not." This set the stage for the efficiency of the meeting, and I am sure reduced the number of distracting comments that often come up in these types of meetings.
- ☐ Assigning someone at the table (strong enough to do it) as an ombudsman to cut off discussion when it would be part of a later presentation (not relevant now), wasn't contributing much (those who love their own voice), or was more appropriate for off-line conversations (people who just can't let go, but might have something important to say).
- ☐ Posting a roles-and-responsibilities matrix with the key organizations across the top as column headings, and functional elements in rows down the left-hand column. The intersecting row-column blocks in the matrix clearly stated which organizations were responsible for what in each of the functions.



DR. GERALD MULENBURG is the Manager of the Aeronautics and Spaceflight Hardware Development Division at the NASA Ames Research Center. He has project management experience in airborne, spaceflight, and ground research projects with the Air Force, industry, and NASA. He is a member of the ASK review board, and can be reached at gmulenburg@mail.arc.nasa.gov.

Mulenburg observed a review for the ground segment of the Kepler Mission, a special-purpose mission in the NASA Discovery Program with a planned launch in 2007. According to Principal Investigator William Borucki, the mission seeks to discover the presence of terrestrial-like planetary systems around other stars to "answer one of the most enduring questions humans have asked throughout history: are there other planets like our Earth in the universe?" For more information about the mission, visit www.kepler.arc.nasa.gov.





ASK Talks with

Dennis Grounds

Dennis Grounds recently finished a one-year assignment at NASA Headquarters in the Office of Bioastronautics as the Acting Flight Program Manager

HE HAS RETURNED TO JOHNSON SPACE CENTER (JSC), where he is Director of the International Space Station Bioastronautics Research Program Office with the NASA Life Sciences Projects Division.

Under his management, the Human Research Facility (HRF) was developed to support a broad range of scientific investigations pertaining to human adaptation to the spaceflight environment and issues of human space exploration. The HRF rack was developed to international standards in order to be compatible with payloads developed anywhere in the world, thereby streamlining the process of getting payloads on the Space Station.

Grounds has worked with NASA for more than 15 years. Prior to joining ISS, he worked with General Electric as a manager of payloads and analysis in support of the NASA Life Science Projects Division at JSC. ASK spoke with Grounds in Washington, D.C., during his Headquarters assignment.

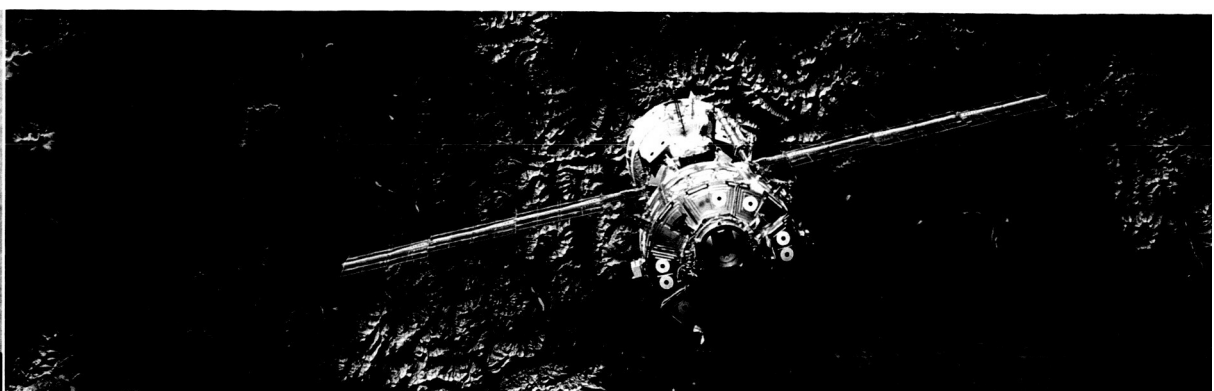
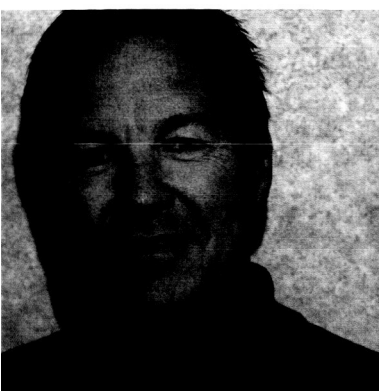
After being a project manager of the Human Research Facility for six years, what brought you to Headquarters?

I was invited. The former Bioastronautics Flight Program Manager had been promoted and wanted to go off to his new job. He didn't have anyone selected to take his place. So, they asked me if I would fill the job for a year, and the opportunity coincided with a natural time for me to make a change. The Experiment Utilization Program I was managing was underway and stable, and it was a good time to step aside and let it be managed by somebody else.

On top of that, it was something my family was enthusiastic about. I have two eleven-year-old sons, who are probably as "portable" right now as they're ever going to be. My wife also works for NASA. We could arrange for her to come up here and work for a year, and then go back to her job. We looked at it and said, "Here's an opportunity. We can act on it if we want to." And so we did.

Do people typically come straight from the field to the job you're in now? Or were you an anomaly bringing the sort of field experience you had brought to the job?

I think that my assignment was unusual because a permanent person usually fills this position. They would normally be here for years and years and years. It's



unusual that someone comes in and does this particular job for one year simply because it requires continuity. I was a stopgap fix; when I leave, they'll be looking for a permanent replacement.

What is exciting about the work you're doing now?

Actually, there's a good bit that's exciting. As with any new job, and particularly one that requires a different perspective, there's always the novelty of simply figuring out the elements you weren't previously familiar with.

Headquarters. I expected that pressure to create something of a "reaction" environment here. As it turns out, politics play a role here, but it's less than I thought it would be.

That was a nice surprise, as I take it.

Yes, it was. I was pleasantly surprised to learn that there's still plenty of room for people to set out a program management objective and not be interfered with. In other words, you can set a goal and achieve it.

If you're going to continue to work at the Center with Headquarters interfaces, especially direct interfaces, there can't be any better experience than to have looked at issues through their eyes.

There's an international element to this job that has been particularly interesting for me.

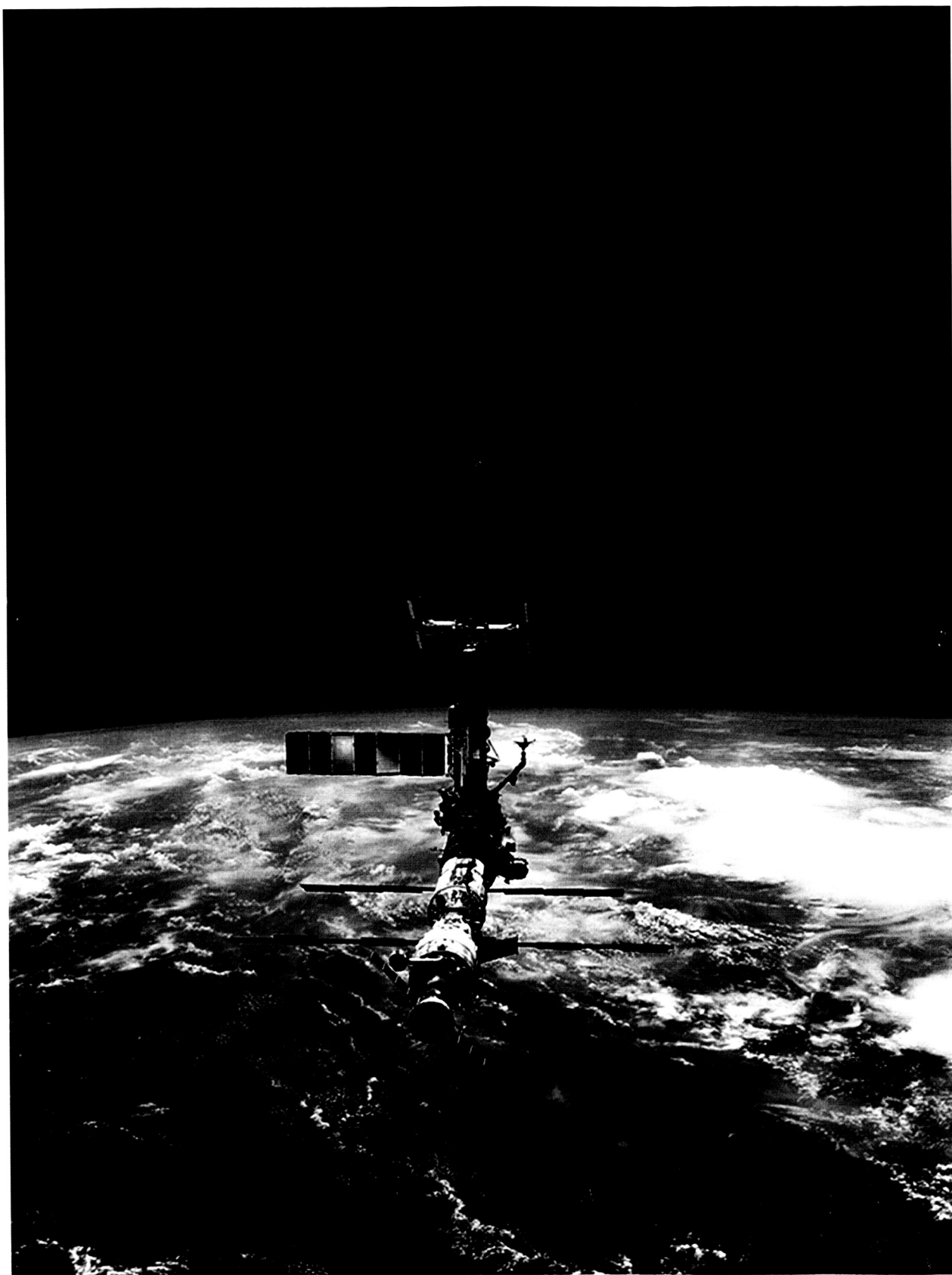
Another thing, of course, is the nature of the environment here at Headquarters. You can't really learn this being at a Center. I would have guessed that there was a lot more external political pressure—answering inquiries from Congress and so on—here at

How much did you know about the assignment before you got here?

I had a pretty good idea of what the job would be like. The person I've replaced is the same person who I was interfacing with while I was still at the Center. Having worked directly with him, I had some idea without actually having done the job what the job was about. We



The International Space Station (ISS) moves away from the Shuttle *Discovery* after a crew exchange on the STS-102 mission, March 2001.





Astronauts Michael Lopez-Alegria and John Herrington install the Port One (P1) truss on the International Space Station (ISS) in November 2002.

worked problems together, with me as the Center-level person and him as the Headquarters-level person, for five or six years now.

What would be the benefits to someone like you, a successful project or program manager at a Center, spending time at Headquarters?

You know that the Agency is putting a lot more emphasis on rotations or jobs other than at your home Center as a requirement for promotion. There is an

Someone might look at your situation and say these circumstances were unique. What would you say to somebody who wouldn't necessarily see a Headquarters rotation as an important career step?

I'm going to return this to you as a question. Would you agree with me that some of the better program and project managers are always trying to find the broadest perspective on their program that they can? What is their Headquarters organization expecting? What is their Center expecting?

I will have a much better feel for personalities and how to work problems. You know whom you can talk to and what they know or how they are likely to react.

emphasis on that, and I think for good reason. However, in my case, I wasn't really looking for a promotion.

It does broaden your perspective. If you're going to continue to work at the Center with Headquarters interfaces, especially direct interfaces, there can't be any better experience than to have looked at issues through their eyes.

I think the best program and project managers are always trying to take the point of view of their customers. Hardly any of them are just focused on getting their job done.



This computer-generated scene of the International Space Station (ISS) represents the first addition of hardware following the completion of Phase II.

Is there a stage in one's career where you're ready for this kind of assignment? When you can bring back what you learn here in the most useful way?

Somewhere in that project manager-program manager zone, I would say, would be the natural time to do that. I would say that you need to have gone through that experience at the Center before you go off and try to look at that job from a Headquarters perspective.

Let's turn things around. What do you think is the most important thing Headquarters can learn from the project manager or program manager who comes here on rotation?

At the project level, you're clearly focused on how to solve the problem of implementation. The Centers have the people on the ground. They're doing the work. They have the problems.

Up here at Headquarters, you own the top-level requirements, in terms of being able to change them or negotiate them with a project. A lot of what they do depends on the information they get from the implementing Center. The more you understand what the work is and how it gets done if you're at Headquarters, the better both of you can take a question and translate it into a discrete request for information and target it at the right person.

As a matter of fact, this comes up every month when we do status reports. If someone here at Headquarters sends down a "fuzzy" question that's not appropriately directed, it causes unnecessary work. Because I have a good understanding of the work that's being done in the field and who's doing it, I send down specific questions and I try to direct them to the right person. In a way, I pre-work any problem I detect by narrowing the focus of my question and by proposing alternative solutions to the problem. It reduces the amount of work required by the project team.

After this rotation, when you return to your Center, how do you think you will be more effective as a manager?

When I go back to the Center, my interfaces at Headquarters will be these same people with whom I

have worked for a year. So, for one, I will have a much better feel for personalities and how to work problems. You know whom you can talk to and what they know or how they are likely to react. All of those things help you be more effective in supporting them when you go back to the Center. Having seen it from their perspective is a benefit.

That sounds like valuable information; I'm curious about the way that you'll share it with other people at your Center.

There are expectations at the highest levels that flow through the associate administrators into this office. I know how it works. I'll take that knowledge back with me.

In addition, since I'm working now to revise programmatic processes and I'm part of making those new designs and decisions, I understand the changes in a way I never could have had I not been part of this. I expect that I'll be the person that gets to communicate these new processes.

As your yearlong assignment winds down, do you have advice for other project managers who might be considering a Headquarters assignment?

Just that I would encourage people who are at the right point in their careers to take these temporary assignments. The Agency wants to see it happen, and it's of benefit to the individuals concerned. The idea of moving to Headquarters for a year was never on my radar before I fell into the opportunity; but for anyone in a transitional period of project work, or someone looking to advance their careers, it's something they should seriously consider.

For my entire family, it's been a wonderful educational experience living here in Washington. It's a good place to be for a year, because there's plenty to see and do. I'm guessing that, in the future, all of us will mark time by the year we spent here. I know that I will. •

I understand the changes in a way I never could have had I not been part of this, and I'll be taking that knowledge back to my Center.





FROM THE EDITOR-IN-CHIEF *Dr. Alexander Laufer*

Small Wins

While it might not seem so radical these days to see the words “story” and “business” in the same sentence, that certainly wasn’t the case when I set out to put together my first collection of business stories

PROCTER & GAMBLE HIRED ME IN THE EARLY 1990’S AS A management consultant. I participated in training programs, procedural reviews, and the like—but I wasn’t satisfied with these traditional approaches. I sought to inspire significant change in the way that project practitioners approached their work, and I thought I had found the right vehicle: stories.

Why stories? To put it simply, stories are powerful learning tools because they stimulate curiosity, they provide context to lessons, and they’re memorable. Stories are also “unlearning” tools. Logical arguments don’t convince people that a change in paradigm is needed; observable action is more convincing. And stories by credible practitioners are as close to observing action as possible.

I wanted to collect the stories of some of the most successful project managers and share them with others in the company. First, I found a sponsor with enough vision to support my idea, and then I assembled a team of eight highly successful project managers who were willing to examine the idea of writing stories about their project work. My long-term goal was to collect their stories in a full-length book.

Transformation efforts take time. After several months, I had no doubt that we could eventually produce a winning product, but I saw that the pace of our progress had slowed, and I worried that enthusiasm for the project was waning as competing development projects vied for attention and dollars.

I proposed we put together a short, preliminary edition of our book and present it to a test audience. The

idea seemed to invigorate my team. Soon thereafter, we produced a booklet, a prototype you might call it, and arranged to have it used in one of the company’s project management seminars. Suddenly, our project was more than just an idea. With a tangible product in hand, the project plan had become a reality.

Not only was the booklet an overwhelming hit at the class, we received a lot of useful feedback, upper management took note, and the number of new stories being written increased. But we didn’t stop there. Recognizing the value of our test product, we produced another interim edition and presented it to an advanced

project management workshop. Again, the results were invigorating. We recruited volunteers to write additional stories, and collected more useful feedback.

By the time we published our final product, *In Quest of Project Excellence through Stories*, there was already demand for the book. We had generated interest in our project at the same time that we tested and refined our product. We motivated our team and our stakeholders while we “de-motivated” our detractors. (Who wants to bet against a proven winner?)

It’s a lesson I’ve seen demonstrated time and again. Effective change agents don’t string their audience along. They don’t spend all their time on processes and plans. They quickly produce interim results, building support for their project as they work towards their goal. Producing “small wins” along the way makes ultimate success more likely.

*Effective change
agents don’t
string their
audience along.*

