INTERVIEW WITH

Rex Geveden

BY DON COHEN

Don Cohen and Ed Hoffman met with NASA's Associate Administrator to talk about his NASA career and his view of the Agency's current and future challenges.

Photo Credit: NASA/Bill Ingalls

COHEN: What do you see as your role in helping NASA achieve its mission?

GEVEDEN: The Administrator recreated the position of the Associate Administrator, which existed in the Apollo era and went away later. It's the top nonpolitical job in the Agency. Griffin wanted someone who could provide continuity from one administration to the next, who could understand why we organized and aligned ourselves the way we did, and could communicate our budget priorities. That's my strategic role. My practical role is to be in charge of the technical portfolio. All the mission directors, associate administrators, and field center directors report to the Administrator through me. Griffin is trying to create a meritocracy in which the best ideas thrive. He has tried to fill major positions—this job, I hope—with strong technical managers, believing, as I do, that executive management is not subject-matter independent. I don't think you could plug me into Bank of America or American Airlines and imagine that I would be very effective, at least in the short term. The Administrator wants managers who understand the space business and are good managers in addition to that. So you see the top echelon of the Agency populated with program managers, scientists, and engineering managers who have worked their way up the hierarchy.

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COHEN: Can you describe a specific instance where your technical background made an important difference?

GEVEDEN: The Pluto New Horizons program was scheduled to launch—and, in fact, did launch—in January this year. It had a nuclear component on board, and there were significant problems with the nuclear launch approval. There also turned out to be qualification issues having to do with structural problems on the RP-1 tank of the Atlas V rocket that was launching the system. The Administrator asked me to get personally involved in the nuclear launch approval, which was both a technical and an organizational issue. The RP-1 tank was technical. I was involved in getting both of those issues resolved so we could make the launch window. Launching this January gave us a Jupiter gravity assist—a slingshot effect around Jupiter that gets us to Pluto five years faster. Had we delayed the launch a year, it would have cost the Agency another $100 million and the spacecraft would have had to run another five years. So it was important to launch successfully on time.

COHEN: What kind of action did you take to help resolve these problems?

GEVEDEN: The effort to clear the radiological health hurdles and get approval for this launch was disorganized and politically fractious; I helped pull that team together so we could submit a nuclear launch request to the White House. For the RP-1 tank, I was involved at the top levels of the engineering review of the resolution of that problem.

HOFFMAN: When engineers are concerned about some issue about the rocket that could affect the launch, you deal with the question of risk in the context of a tight launch window. If you don't have a strong technical background, how can you make that decision?

GEVEDEN: We've been driving for a clear separation between institutional authority and program authority in the Agency. The authority has been muddled in the past. When Griffin came to the Agency, he said, "We're going to have a clear chain of command all the way to the top of the Agency for technical authority and a clear chain of command all the way to the top

for programmatic authority. That's the way we'll get technical independence."

COHEN: You're the point where they connect.

GEVEDEN: Yes, which means having the ability to adjudicate a technical or programmatic issue at the top of the Agency. That's what happened in the case of the RP-1 tank.

HOFFMAN: To me, the new governance model makes sure you have a strong, technically independent engineering capability that can raise issues that are core to engineering and strong, independent project management that reports to the mission organizations and ultimately, if there are differences, to your position.

GEVEDEN: Over the years, our program and project management became almost too muscular. I think the CAIB [Columbia Accident Investigation Board] was right in saying program authority was excessive. We've had a program-dominant culture. If the program manager said, "I'd like to improve the factor of safety on that structure, but I don't have time," that was the end of the discussion. We want sufficient strength on the engineering side to hear the other argument, whatever the eventual outcome. That technical independence is part of technical excellence. The other part has to do with the selection of engineering fellows, who are thought leaders in the Agency in certain technical disciplines, and the ones who approve deviations to NASA-wide standards when deviations need to be approved. It's a whole package that has to do with reemphasizing the importance of engineering in the Agency.

COHEN: Do you think NASA has been effective at getting support from the public and government?

GEVEDEN: The Agency's biggest successes in the last decade or two have tended to be in the science side of our business. Everyone recognizes the importance of the Hubble Space Telescope. To a lesser extent, people recognize Chandra and Spitzer for doing x-ray and infrared images of the universe. Almost everyone knows about the Mars rovers that are on the Martian surface right now, or Galileo and the Huygens probe that we dropped onto Titan this past year. The science-attentive public has been excited about that part of NASA's business for years. The other part of the business—human space flight—has not generated as much excitement because we've basically been in low Earth orbit for thirty years. The building of the International Space Station has been an amazing thing. But I think we could have done better things with the money we've spent on human space flight. Having said that, I don't think it's NASA's job to sell. We're an executive branch of the government and execute the priorities of the president and Congress. We never will and never should have an advertising budget. We're precluded from lobbying. It is our mission to communicate what we're doing and communicate the knowledge we acquire. We do the business of the government in civil space, and we hope that we have a compelling vision that the people and Congress support.

COHEN: You've talked elsewhere about watching the first shuttle launch on television as an inspiring, career-turning moment for you. Is there some equivalent inspiration for young technically minded people today?

GEVEDEN: Yes. Our vision for exploration. The president of the United States came to this building and announced a new vision for space exploration. We have a compelling vision for the human space flight program for the first time in forty years. We'll launch an exciting robotic mission to the moon in '08. We'll test launch our new crew vehicle by the beginning of the next decade. We will be building an outpost on the moon—it won't be a flags-and-footprints campaign; we'll be doing exciting things on the surface. Then we'll be planning for Mars. I think people who want to study engineering will rally around the program.

COHEN: In conversations I've been having within NASA, people emphasize the importance of collaboration and knowledge sharing across the Agency to achieve the mission. Do you see collaboration as especially important?

GEVEDEN: Absolutely, and I believe collaboration is ultimately a human undertaking. A lot of people imagine that the solution to collaboration is a great software tool, but the idea that someone is going to log on to their computer in the morning and be in their community sharing information is a pipe dream. This is where I think Ed Hoffman got it right. The way to make collaboration work is partly technical but primarily a human

endeavor. That's one of the reasons I've liked the stories in *ASK Magazine*. I also like face-to-face human contact. In a Q&A at a risk management conference, somebody asked me, "How are we going to capture the knowledge of Apollo and Spacelab and the shuttle people who are retiring from the Agency?" I think the speaker imagined a knowledge system, but my answer was, "Go get the people." For the Exploration Systems Architecture Study—done primarily by in-house people and some very smart consultants—we put together a graybeard review team that had the likes of Bob Seamans and Jay Greene on it. Bob had my job in the sixties. Jay Greene, who was the chief engineer on the space station and had been launch director on Challenger, is a famous technical curmudgeon in the Agency. I think this computer [the brain] is a lot more complex than that one [the machine on the desk]. Unless people understand that, they're going to keep going down the wrong path.

COHEN: Some corporate efforts to capture retirees' knowledge result in videos and documents no one looks at.

GEVEDEN: That's a common story. Years ago, someone briefed me on all the great lessons stored in NASA's Lessons Learned Information System. How many times have I logged on to it in my career? Zero. It may work for some people, but it doesn't for me.

HOFFMAN: A study we did found that 23 percent of project managers used that kind of system. Project complexity means that you're going to call an expert if you have a problem. You have to go to the tacit knowledge of experts who've dealt with the same problem.

COHEN: Are there other things NASA might do to support knowledge sharing?

GEVEDEN: The other day we met with some folks from Northrop Grumman who said that some old-timers at the Grumman New York operation are voluntarily archiving design drawings, organizing them so they'd be useful to the present generation of lunar explorers. It occurred to me that we might pull together a mentoring program pairing retired smart people with younger people now in the system. That could be a low-cost way to bring in people who don't want to be consultants or full-time employees but want to give something back. Eighty percent of the people at NASA are here because of the vision, the missions. People will do extraordinary, unexpected things because they love the space program deeply.

HOFFMAN: You should talk about how your career evolved. I think Rex has proven the value of hands-on experience combined with the tools that have been available—the mentoring support and training experience.

GEVEDEN: I have invested a lot in career development over the years. I'm a goal setter. I write down and track goals related to career, family, and other areas at least on an annual basis in a pretty detailed way. When I wrote my first set of NASA-related goals, I said I wanted to be a project manager and a program manager. Then I wanted to manage people who manage projects and programs. It was about that time that I first ran into Ed, who was the leader in NASA in figuring out that it was going to be important for the Agency to develop a project management career path. He understood that NASA was about programs and projects: mission success not just in terms of flight success—which was the biggest thing—but delivering projects on cost and on schedule. We were entering an era in which budgets were not unconstrained like they were in Apollo; they required more discipline and more project management capability. NASA eventually developed a Project Management Development Process—PMDP. I was a guinea pig, one of the four at my field center to get involved, and went through the certification efforts about ten years ago. I took the requisite training and tried to check off the experiential boxes that would get me certified to level four, the top level in our system. I ended up being the first person certified level four and featured that prominently in my job applications and in my résumé. General Dailey, who was the deputy of the Agency, gave my certificate to me in a public setting and created a lot of buzz.

HOFFMAN: Some people wait for the organization to take care of them. But if you wait at the bus stop, the bus may not be going where you want. Rex is an example of taking personal responsibility for using organizational resources. NASA is blessed with resources, but people need to take responsibility for figuring out what is right for them.

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GEVEDEN: I happened to be coming along when the Agency was clamoring for project and program managers with any amount of experience. I went from doing projects that you could put on a chair to running an observatory-size spacecraft—Gravity Probe B, which was a 7,000-lb. engineering marvel, an amazingly complex spacecraft. It was a baptism of fire for me. It was the best way for me to learn, but it was not without some risk to the Agency.

COHEN: What were some of the challenges?

GEVEDEN: I had never worked with a large prime contractor before. I hadn't had experience interfacing launch vehicles to spacecraft, not in a big way. I dealt with senior-grade people from university and industry, and it was hard for me to understand and exercise my authority when I was so outranked. An interesting thing about project management is that you figure out all the things that should have been done when you get about halfway through. Some you can fix and some you can't. Gravity Probe B was a management experiment—that was the way it was described in the program commitment agreement. The idea was that NASA would stand back and let the contractor, Stanford University, succeed or fail. But there's no tolerance for programmatic failure or mission failure in the Agency, and there shouldn't be.

COHEN: So you couldn't step back?

GEVEDEN: Growing our authority over time and trying to do it in a way that wouldn't disrupt the program and the stakeholder relationships was a balancing act that helped me develop as a manager. One of the miracles of the program was how the Stanford team grew. Some young Ph.D.s and post-docs developed technical program management skills very quickly. It was amazing to watch those guys mature and blossom. There were something like seventy-nine Ph.D.s awarded at Stanford on the Gravity B program.

COHEN: Should program and project managers coming up now take on projects that are a stretch?

GEVEDEN: Yes. Pick your energetic, talented, ambitious folks and give them a stretch. I would rather do that than be safe and give the program to someone with more experience but less drive and less reach.

HOFFMAN: One last question: What do you hope to accomplish in this position in the next five years?

GEVEDEN: One thing, because I believe so strongly in the program, is to make sure we have a thoroughgoing, highly supported exploration program. Space exploration is one of the ways that great nations assert their leadership. It's an expression of our autonomy, our culture, our way of life. Another thing I'd like to do is to see that processes around governance and technical authority become so good and so embedded that they can survive the transition from one administrator to the next. I believe that we're organized and executing now better than I've ever seen before. I would like to help preserve that legacy.