

INTERVIEW WITH

Wayne Hale

BY MATTHEW KOHUT

Former Space Shuttle Program Manager Wayne Hale's career roughly paralleled the life cycle of the Space Shuttle program. Hale began his career with NASA in 1978 as a propulsion officer at the Johnson Space Center and later became a flight director in Mission Control for forty-one Space Shuttle missions. He went on to hold numerous positions in the shuttle program, including launch integration manager, deputy program manager, and program manager. For the last two years and four months of his NASA career, he served as the deputy associate administrator for strategic partnerships, responsible for coordinating interagency and intergovernmental partnerships for the Space Mission Operations Directorate at NASA Headquarters. Matthew Kohut spoke with him two weeks before his retirement at the end of July 2010.

KOHUT: Throughout your career you worked in the shuttle program at just about every conceivable level. Which jobs presented the steepest learning curves, and what did you do to get up to speed?

HALE: The first job that I had coming in as a “fresh-out” from college—trying to learn how to be a flight controller, trying to learn about the Space Shuttle and its systems, particularly its propulsion system—was a big challenge to me because it was unlike

anything I'd ever done academically or in any other part of my career. NASA is a special culture, with a special mind-set. You have your engineering background, but you have to put it to use in ways that are completely different in operation than what they teach you in the university.

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Going from being a person in Mission Control sitting at one of the consoles being responsible for one discipline to being a flight director, where you have to understand all twenty-three different disciplines that are present in the Shuttle Flight Control Room, was also a big step. It was like going back to school again. There was so much technical [knowledge], so much rationale behind why things are done the way they're done. It's a huge amount of knowledge you have to amass to be able just to ask the right questions to lead the team toward having a safe and successful shuttle flight.

Then when I made the transition to the Space Shuttle Program Office, first as launch integration manager, then deputy program manager, and finally program manager, I found out that there were gaping holes in my knowledge and background, in particular regarding contracts, law, business, accounting, budgeting. All of these were things that I had never had to deal with during twenty

or so years of working for NASA. I had to learn about all of those things in very short order.

So each one of those jobs presented a different challenge, and the only way I know to get through any of those is the same thing that I've done every step of the way, which is to buckle down. You talk to people who know how to do what you're attempting to do. You get a list of subject matter that you need to study, and you just roll up your sleeves and get after it. And of course you watch the people who are doing it, who are experts, and you ask a lot of questions. At some point you get to spread your wings and see how you can do. Sometimes you soar with the eagles and sometimes you crash. That's part of the learning experience, too.

KOHUT: You mentioned that you had mentors early on. Who were your mentors? Did you have different mentors at different stages of your career?

HALE: I absolutely had different mentors at different stages. At the end game when

I was in the program office, having never been in a program office before, Bill Parsons was a great mentor to me. He was the program manager. He taught me a tremendous amount about running a big program, about the things I didn't know, the things that I needed to learn. I also learned a lot from Lucy Kranz, who was our procurement/business office manager. She helped fill in all those parts of my education that were blanks. A large part of what I know about federal acquisition regulations, contracts, procurement, and how to do budgets comes from Lucy Kranz, who continues to do great work on different programs for the agency.

When I worked in the Flight Directors Office, the boss was Tommy Holloway, who was a master flight director. I also learned from some of those who had preceded me, like Chuck Shaw and Ron Dittmore. They were all great mentors to me. Going back to right when I walked in the door, there were several Apollo veterans who were ready, willing, and able to teach young graduates what it meant to work in Mission Control, and what sort of things you needed to prepare yourself for. And of course Gene Kranz was in charge of the organization in those days, and you learned a lot at what we used to call the Gene Kranz School for Boys. He taught us in no uncertain terms what was expected.

KOHUT: Nearly a year after the *Columbia* accident, when you were serving as shuttle deputy program manager, you wrote your team an e-mail (which you reprinted in your blog) that said, "... we dropped the torch through our complacency, our arrogance,

self-assurance, sheer stupidity, and through continuing attempts to please everyone." Do you have any thoughts on how large organizations can keep their edge and continue to improve even when they succeed?

HALE: The best advice I ever got—Tommy Holloway told us over and over—is, "You're never as smart as you think you are." If you ever get to the point where you think you've got it under control, you really don't, and you need to be always hungry and looking out for the indications that things aren't going well. It's a difficult thing in a big organization to keep that edge, and it's particularly difficult when things are going well. The shuttle had had a long run of success. I think we flew eighty-seven flights in a row that were all successful.

In particular, the political leadership in charge expected us to do more with less. They kept telling us that spaceflight was routine and mature, and that we had solved all the major problems and just needed to not slip up on little things, and that it ought to be easier and faster and less expensive.

The truth of the matter is that, with the current state of the art, spaceflight is extremely difficult. It is fraught with danger because of the high speeds and extreme environments involved. It requires extraordinarily close calculations on the amount of material and the physical structure of the space ship, because mass is at a premium in everything we do.

After a while of getting, "This is not as hard as you think it is. This is mature technology and a mature vehicle with large margins. We know what we're

doing," drummed into your head, you begin to fall into that trap, even though deep down in your heart you know that's not true. I've seen that happen in other industries and other organizations that have had a long run of success. The fact of the matter is that, particularly in spaceflight, you cannot let yourself get arrogant. You cannot think that you've got everything under control. You've got to be vigilant. I think that's true for any kind of high-risk, high-technology endeavor, though it may be true in other fields as well.

A lot of us wish spaceflight were easier. I do. I wish it were easier and less costly. I wish it were like getting in your car and driving to the grocery store. But it's not there. Many people in the media profess that it is easy, that it should be simple and cheap, and that somehow those folks who are currently in the field have not done a good job, and therefore it's costly and looks hard. I just don't believe that to be true. I believe it's a very difficult thing to do that requires a great deal of dedication and precision. And unfortunately it's not inexpensive at this point in history.

KOHUT: What are you most proud of from your tenure as shuttle program manager?

HALE: The thing that I am most proud of is building a team that has been as successful as it has been in the five years after we returned the shuttle to flight. Things have been going very well. Being basically a worrier, I worry about things when they're going well, but the team is doing very well because I think they are paying attention to the fundamentals and looking very hard at the symptoms

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of things that are not going as well as one might wish. So I’m very proud of the team and the culture change that we brought about. You would think that returning the shuttle to flight would be at the top of the list, and it is in some ways, but the thing I’m most proud of is building the team that has been able to carry on and be so successful.

KOHUT: You mentioned the culture change. I’d like to get your perspective on what it was and what it became.

HALE: Again, the culture change had to do with the arrogant mind-set that basically said, “We have been doing this for so long so well that we know what we’re doing. We have got this difficult subject, this difficult environment under control, and we know we can get by with cutting corners because we know there’s a lot of margin in the system.” The culture change was to take a step back and say, “No, we really don’t know.” To go back to what Mr. Holloway taught me, we’re not as smart as we think we are. This is a very difficult thing to do. The margins everywhere are very small. It’s not ordinary, routine, or mature. And, therefore, we have to take great care with what we do.

And, oh, by the way, our political overseers had kept cutting our budget to where we had emaciated our safety and engineering systems. We had to go back and tell them that that just would not do if we intended to fly this vehicle safely. It was going to take the resources to provide the proper oversight and insight. We were able to convince them of that. And so it goes. I think that was a huge culture change, both for those of us that worked in the program and for those who were outside the program and in positions to make decisions about national resources.

KOHUT: In your blog, you’ve shared a lot of “stories from the trenches” of the shuttle program that had not previously seen the light of day. In your first post, you said you wanted to start a conversation. Did the purpose of the blog change over time for you?

HALE: The purpose of the blog was outreach, to tell people a little bit about what it takes to fly human beings in space and run a big program, and [share] a little bit of what goes on “behind the curtain” inside NASA, because I think people are interested. So much of what we at NASA put out is what somebody once termed

“tight-lipped and technical.” Not very interesting, very arcane. This is a human endeavor, and there are people involved in it. The things that happen show us to be frail and mistaken at times, but strong, resolute, and innovative at other times, which is the way it is with people. I’ve enjoyed sharing some of these stories. Trust me, there are more out there, some of which I may never share [laughs] and some of which I have in mind to share, because it’s not just about spaceflight. It’s about people, and how people can rise to the occasion, react under pressure, and do something that is very difficult, with great élan and great pride in what they do.

It’s been a lot of fun. We get feedback. People get to make comments and post them. I get to review those comments before they go out, which is an interesting process. I originally thought I’d just approve them all. Then you find out that there are certain features of the Internet—people perhaps are trying to do some things that are not appropriate. You really do have to read them and evaluate whether or not they’re appropriate to post. Those that are appropriate have been thoughtful in many cases, and frequently they have brought to mind another topic that I need to discuss. So it has been a conversation. ●