Space Policy Institute

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Implementation Issues and U.S. Industry Panel

Thank you, Scott, for hosting this impressive gathering. From the very full and comprehensive agenda for the afternoon, I'm not sure there will be anything left for the Administration and Congress to do regarding space after all the suggestions we'll hear are implemented.

And I guess that's the rub – implementing a space policy that, in itself, is pretty comprehensive.

To twist an old phrase, *Policy with resources is vision; policy without resources is fiction.*

As tempting as it would be to launch into a commentary on the Policy: what I like, what I'd rather see changed, who should do what, how soon, why more resources will be needed……our task this afternoon is to address implementation.

As you've heard, my co-panelists bring enormous experience in industry and in dealing with the linkages between policy and Industry. I'll address two areas that I think are representative of broad challenges and yet apply fairly directly to AIAA's role in

the aerospace world, which is to be an advocate for the profession and the industry, for those working in it now and the generations to come, and a forum for exchange among those professionals.

So, I will spend the next few minutes on two specific areas in the policy: the need to "Develop and Retain Space Professionals" and "Commercial Space Guidelines."

Developing and retaining space professionals has been a stated priority since at least the Rumsfeld Commission in 2000, one that has been reiterated by Congress and two Administrations. Obviously, and as written in the policy, developing and retaining space professionals isn't an end in itself. *Unless it leads to mission success in operations, better acquisitions, more advanced research and development, better national security or viable commercial space endeavors, why bother*.

But <u>what is this elusive "space professional</u>?"

By inference from the DoD's Directive on the Management of Space Professional Development, a *space professional is a well educated, competent, motivated person, trained and experienced in: the operational demands of the space medium; the technical requirements of space vehicles and ground systems; the acquisition of space systems; space-related*

science, technology, research and development; space unique tactics, techniques and procedures; the needs of the end users of space capabilities; and the ability to formulate new space doctrine; ….. among other things.

The national space policy links space professional development directly to STEM education – programs in Science, Technology, Engineering and Mathematics – and I think that really IS the key to both being a space professional and developing the next generation.

I am not suggesting that every space professional needs to be a scientist or engineer – far from it. AIAA is a technical society, composed primarily of engineers and scientists, but we have a standing committee on Public Policy and committees in areas such as history and management. Our President-Elect, Brian Dailey, has a PhD in International Relations. Many of our members, and I'm sure many here today have degrees in something other than a hard science or engineering, and you're all engaged in space. In fact, if you are here and you aren't an AIAA member, you probably should be.

The primary skill set of many professionals working in aerospace is finance, or law, or business or one of many other disciplines that don't call for a technical degree.

Many very competent space operators don't have technical degrees.

But, I would argue that if someone doesn't know, for example, *that getting to, and operating in, low earth orbit is fundamentally different than getting to, and operating on, Mars,* he or she isn't yet a space professional. And if that person doesn't have the very basic level of technical knowledge to be able to understand the difference between the two, becoming a space professional is probably out of reach.

And that is why the direction in the national space policy that "*Departments and agencies shall promote and expand public-private partnerships to foster educational achievement in STEM programs, supported by targeted investments in such initiatives"* is so absolutely critical if we are going to sustain our nation's leadership in aerospace.

Some fraction of those who are exposed to high quality STEM programs early and throughout their K-12 education will get bitten by the technical bug – they will continue on to take the courses that eventually lead to degrees in science and engineering and math. In the workforce, they will provide the hard-core technical expertise that is an essential underpinning in every area of commerce that actually involves the production of something other than services – be it mining, construction, automotive, aerospace, power generation, computers, communications systems, whatever. And some of those will become space professionals.

But, far more young people that are exposed to good STEM programs will develop a basic understanding of how and why things work, and then they will swear to never take another math or science course again as long as they live. But that basic understanding will stand them, and us, in good stead as they go into fields that aren't technical, but that interface with things that are. And some of them will be space professionals, also.

There are probably more STEM initiatives than there are active payloads in space. Some succeed, some don't, all are well meaning and the people doing them work hard. We have an active, quality program. Elliot's Space Foundation does excellent work in teacher training, and many of Marion's member companies are the corporate leaders in STEM programs.

What's needed, in my view, is an initiative, adequately funded by the government, to <u>bring us together</u> so the whole can become more than the sum of the parts. And, perhaps as important, some way to ensure, or <u>require</u>, that the States integrate exciting, aerospace-related STEM programs into their already full required curricula.

The second area I'll mention, more briefly and more my own thoughts, is Commercial Space – both because it's important to AIAA, and also because I think what we do with respect to commercial space will have enormous impact on our space capabilities as a nation 10, 20, 50 years from now.

A long time ago – back when I had a life, as I'm fond of saying – I had the privilege of commanding the Air Force organization that operates Cape Canaveral. For those who may not understand the distinction, Kennedy Space Center is where NASA launches the Shuttles. Cape Canaveral is where government and contractor teams launch most of our expendable, and, yes, commercial, launch vehicles headed anywhere in space except into polar orbit.

The day I took command there I did a local TV interview, and was asked what my goal was for the Cape. My answer was that I wanted to double the rate of commercial launches.

That may seem to be a strange answer from a person whose main responsibility was launching Delta and Atlas and Titan rockets carrying military payloads. But it was my firm belief that the more we do across-the-board in space, including commercial, the better we'll be able to do the government missions.

My belief hasn't changed, but, of course, the commercial space world is fundamentally different from what it was in the early 1990s. Back then, commercial meant, mostly, geostationary communications satellites and some launches.

Today, as an example, a totally new industry, in this country, commercial space imagery, is thriving. Whether or not the government is a major purchaser and whether it would survive without government purchases matter not at all.

The fact is that the product meets a variety of needs, including the government's – and it meets all the tests of being commercial: *private sector bears a reasonable portion of the risk, is responsible for the activity, operates with typical market-based incentives and makes the product available to government and non-government customers.*

Whether the government could provide the product itself is no longer an issue – it's a matter of policy that the government WON'T, or at least isn't supposed to, do things that can be procured in the commercial marketplace.

Commercial launch, especially from government facilities, is still evolving. Some would argue that things like Delta IV and Atlas V aren't commercial, while Taurus II and Falcon 9 are. To be sure, more of the infrastructure for the EELVs is supported by

the government, but that was always the case with the earlier generation of commercial launch vehicles – Delta II, Atlas II and briefly Titan III.

Despite what some who should know better have asserted, Boeing and Lockheed Martin invested much more in the initial development of the EELVs than did the government. They were intended to be commercial systems, and the government procures launch services. Unfortunately, the commercial market that was envisioned in the late 1990s didn't materialize, and the government has stepped in to ensure that two vehicles capable of delivering national security payloads to orbit remain viable. That doesn't make them government systems, any more than is the case with commercial imagery systems.

I think the greatest challenge for the government and industry in implementing the Commercial Space Guidelines will be the tension between allowing the market and commercial practices to have a major role in driving behavior and the desire of the government manager to have control.

For example, it was reported a couple of weeks ago that if the manifested April, 2011, SBIRS launch slips much beyond its launch date, it will have to move to 2012 - because there are

two NASA planetary missions behind it. The two planetary windows are firm, and they shouldn't be violated. The first is Juno, scheduled for August 5, more than 3 months after SBIRS. The second is the Mars Science Laboratory on November 25, more than 3 months after Juno.

I'm sure there's more to the story than those bare bones, but if that IS the story, it's crazy. If it takes more than three months between launch centers to prepare and execute a launch on a vehicle that is as good as the Atlas V, that's crazy. Perhaps more to the point since, if <u>any</u> payload ties up a launch system for months so that no one else can launch, that's crazy, too. Doesn't mean it won't happen, or shouldn't, with the way we do business, but it's crazy.

It's crazy, it's a mindset and it isn't commercial. The biggest barrier to commercial space enterprises that include the government as one among a broad customer base is the government customer – how the government buys and how they act as a customer.

The Policy says to use commercial when it's available, or modify commercial to meet government requirements. *Even if implemented, that isn't enough,* because it doesn't challenge the government to modify its requirement a little to be able to use a commercial product.

It takes a good manager to do that, one that's educated, motivated, competent and experienced.

I guess it takes one of those space professionals.

I began by quipping that: "*Policy with resources is vision; policy without resources is fiction."*

The 2010 national space policy isn't the first to require more than the available resources can support. If we change how we do things, we can do a lot more with the resources we have than we've done in the recent past.

But regardless how well we implement, the tough challenge will be to decide what things are most important, and, as Nike says: Just Do It.

OK, enough soap box. Scott, thanks for including me on the panel, and thank you all for your interest in the US space program.