

Interview with Marvin Sambur, Assistant Secretary of the Air Force (Acquisition)

Pathfinder Program Testing the Potential of Spiral Arms Development

“Have you ever noticed how much faster we’re able to deliver things when we’re at war, how we’re able to deliver in months what might otherwise take us 10 years?” Dr. Marvin R. Sambur, Assistant Secretary of the Air Force (Acquisition) recently asked an Air Force audience. He provided the answer, “What do you think the difference is? It’s that everyone’s talking to one another, all the time.”

The cornerstone of Marvin Sambur’s efforts to bring a “warlike mentality” to Air Force acquisition is captured in his initiatives under the banner of “Agile Acquisition.” Three Agile Acquisition initiatives—Collaborative Requirements Development, Seamless Verification in Testing, and Technology Transfer—are the foundation for Agile Acquisition and were approved by Sambur in February this year for implementation.

These initiatives aim to get equipment to the field quickly through use of a technique or strategy called evolutionary acquisition. In the following discussion, Sambur responds to a series of questions from *Program Manager* and talks about his efforts to “jump start” these initiatives as tested in the “Pathfinder” programs.

Q When you started on this job in November 2001, what did you see as your major problems?



Marty Evans (left), Director, U.S. Air Force Acquisition Center of Excellence (ACE), discusses Pathfinder programs and their application to other Air Force programs with Dr. Marvin Sambur, Assistant Secretary of the Air Force for Acquisition and Air Force Service Acquisition Executive. The discussions took place in Sambur’s Pentagon office on Aug. 4.

A Two major problems. The long time it took the acquisition system to deliver new capability to the warfighters; and our credibility—we were perceived as delivering late, delivering less than promised, and at greater costs.

Q Did you have an answer?

A I certainly had a challenge. Let me give you some background on the creation

of an initiative nicknamed Agile Acquisition.

Right about the time that I became the Assistant Secretary, the Air Force held a series of senior management meetings in the fall and winter of 2001/2002. We wanted to jump start changes to the acquisition system. Secretary of the Air Force James Roche sought to foster a culture of innovation and reasonable risk taking and gave us some tough goals. He wanted to shorten the acquisition cycle times, i.e., deliver today's technology today; and wanted a flexible system that would allow us to quickly insert new technologies into systems throughout their life cycles. His bottom line was to build credibility with our customers—the warfighters. For me, the question was how to do this. My answer—Agile Acquisition!

Q
What is included in your Agile Acquisition initiative?

A
Agile Acquisition is our strategy to get capability to the warfighter quickly and to build our credibility. It is based on the simple premise of working together—collaboration—among four key groups: the requirers, the technologists, the testers, and the acquirer, who will all improve the system. It consists of three separate initiatives—all requiring close collaboration with these same groups.

Collaborative Requirements Process
The first initiative is called “Collaborative Requirements Process.” In the past, the warfighters developed their requirements, tossed them over the wall, and we tried to translate their needs into contract documents. We often missed the point and this increased the time to field and test systems, and often left the participants unhappy with the results.

By working together as a team at the outset when requirements are first developed, the acquisition and technology professionals could provide immediate feedback to the requirer on technology and development issues,



When in a sole-source environment, early contractor involvement should be the norm. Industry can help us to understand the art of the possible and can prevent, to some degree, the temptation to overstate specific requirements.

while the testers would be involved to ensure that what was required could be tested. This ensures that we understand what the testers are really looking for, plus we will be able to provide them with a realistic assessment of our ability to accomplish what they want.

Focused Technology Transfer

This leads directly to our next initiative—Focused Technology Transfer. Once we know what the warfighters want, the question to ask and answer is obvious: Is the technology available? The Technology Transfer initiative is designed to closely link research and development efforts in the labs to the specific needs of programs. By fostering a closer working relationship with the labs and the program offices, the labs will understand program needs.

With this understanding, the labs will be able to adjust their projects to directly contribute to delivering military capability to the warfighter. The result we want is to have the labs realign high-priority limited resources to focus on bringing high-value technology to a higher technology readiness level—ready for integration into a new weapons system.

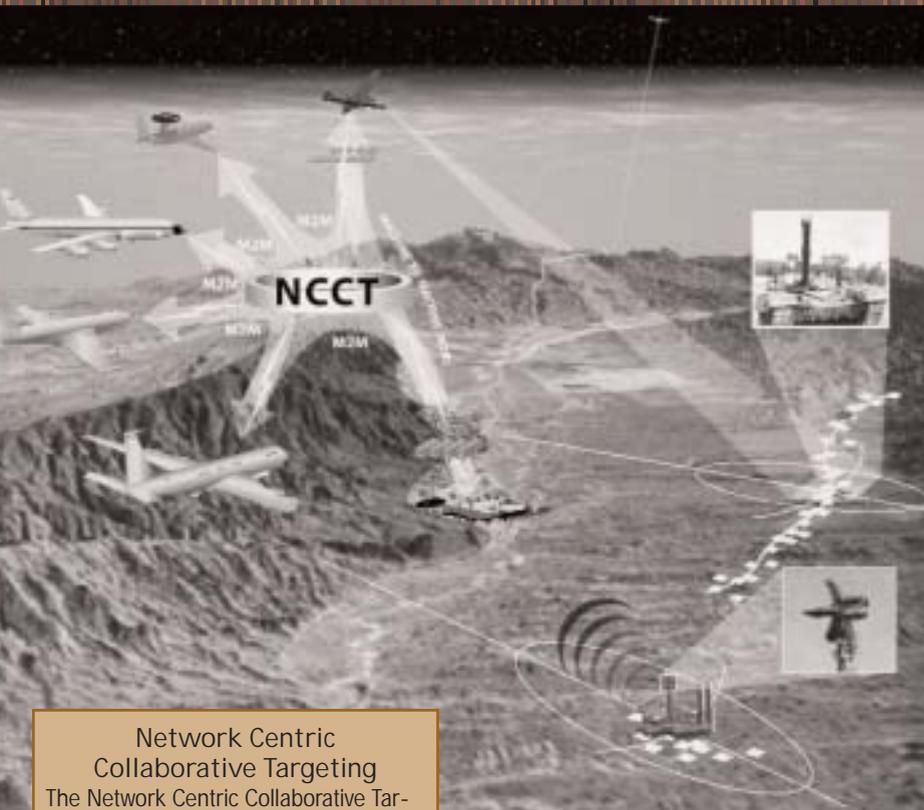
Seamless Verification

The final initiative—Seamless Verification—is designed to bring testers in early, to get their advice on testability of requirements and their early involvement in developing a test strategy. And then the key element of Seamless Verification is to remove the seams, at least as it makes sense, between DT [Developmental Testing] and OT [Operational Testing].

As most acquisition people know, the barriers between DT and OT testing were treated as almost “sacrosanct.” This limited our ability to learn from what happened. Our approach was to reduce the overlap, which wastes time and resources. While we have to protect the impartiality and integrity of OT&E [Operational Test and Evaluation], much of the DT&E [Developmental Test and Evaluation] effort could be separately evaluated for OT&E purposes—let's remove the seams!

Pathfinder Programs—Blazing

Six Ongoing Programs Pioneere



Network Centric Collaborative Targeting

The Network Centric Collaborative Targeting (NCCT) program is an ACTD designed to provide commanders/decision makers with time-sensitive targeting data to make more accurate, quicker targeting and engagement decisions. Using networking principles and distributed processing with common algorithms and common databases, this system will decrease the timelines for detection. Using a spiral acquisition strategy, the Air Force plans to develop an NCCT core capability with demonstrated military utility by FY04. Future spirals will provide an Initial Operational Capability (IOC) by FY07.

U.S. Air Force Image



Unmanned Combat Air Vehicle

The ongoing X-45 Unmanned Combat Air Vehicle (UCAV) program is a joint Defense Advanced Research Projects Agency (DARPA)/U.S. Air Force effort being conducted in multiple overlapping spirals of increasing capability. The UCAV is to be an affordable weapon system that expands tactical, and perhaps strategic, mission options and provides a revolutionary new element in the air power arsenal to counter fixed, mobile, and unlocated elements of an advanced Integrated Air Defense System (IADS) through preemptive destruction beginning in FY08. It will exploit the design and operational freedoms of relocating the pilot outside the vehicle, while maintaining the rationale, judgment, and moral qualities of the human operator.

Photo courtesy Boeing Media



a Trail for Others to Follow

ring Evolutionary Acquisition



B-2 Radar Modernization Program

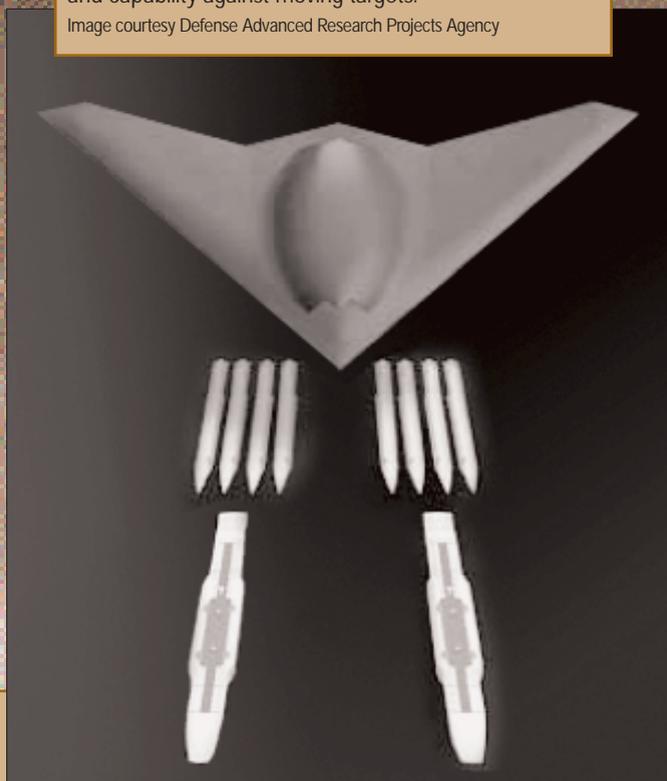
The B-2 Radar Modernization Program (RMP) meets the need to develop a radar system in a frequency band where the U.S. government is a designated primary user. The current system cannot interface with primary users due to interference by secondary users. The B-2 RMP is planned for three increments consisting of at least five spirals. Each increment of this program will provide increased capability, including extended range for the B-2 fleet.

Photo courtesy Boeing Media

Small Diameter Bomb

The Small Diameter Bomb (SDB) program will deliver to the warfighter a small diameter bomb against fixed targets. The acquisition strategy envisioned an evolutionary acquisition and spiral development approach to delivering capability. Boeing and Lockheed Martin are currently competing in the two-year Concept Advanced Development (CAD) phase, with a downselect expected to occur in September 2003. The first capability is planned for FY06 for the F-15E. Future spiral developments will include integration on other aircraft (F/A-22) and capability against moving targets.

Image courtesy Defense Advanced Research Projects Agency



Global Hawk

Global Hawk is intended to provide all-weather, high-altitude, long-endurance reconnaissance, surveillance, and target acquisition, with near real-time coverage for extended periods in support of military operations. It is designed to operate in low-to-moderate risk threat environments and will provide imagery to existing command and control nodes, enabling enhanced battlefield situational awareness. Building upon a successful ACTD program, Global Hawk planned an acquisition strategy that incrementally delivered increased capability to the warfighter based upon a spiral approach to development.

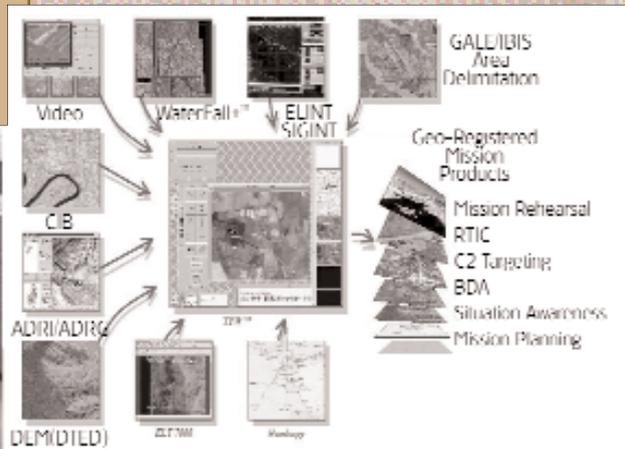
Photo courtesy Northrop Grumman, Ryan Aeronautical Center

Distributed Common Ground Station

The Distributed Common Ground Station (DCGS) is a system of systems that will field a worldwide deployable intelligence ground system capable of receiving, processing, exploiting, correlating, and disseminating national, theater, and tactical reconnaissance intelligence data. The current system, operating at capacity, comprises legacy and uniquely developed components. As new intelligence, surveillance, and reconnaissance platforms are deployed, they will stress the current system beyond its means. The program strategy was to modernize with increased capability and deliver

a new system quickly (three to four years) through a spiral development strategy. The new system would provide an open, flexible architecture to enable rapid technology insertion, enhance distributed operations, and reduce the system sustainment burden.

U.S. Air Force image



Q

We have heard a lot about the Pathfinder programs. How did they get started?

A

Before I answer that, let me point out that in the past we have used the “big bang” approach—on average it took 10 years or more to deliver a system to the warfighter. Both the Air Force and DoD are moving to replace this approach with an evolutionary acquisition strategy. In this strategy we will deliver incremental capability to the warfighter. This increases the need to “talk” to both the warfighter and the tester, since capability documents will change and testing will need to capture the evolution of the system.

Now back to your question. I believe in testing before buying. We had some good ideas and needed a way to test these initiatives. Thus in March 2002, Pathfinder was created—programs that could blaze a path for others to follow, very much like our Pathfinder forefathers. While we looked at a large number of programs, we finally identified six Pathfinder programs last year to pioneer these initiatives—all with a bottom line goal of building credibility within and outside the acquisition community and reducing cycle time by a ratio of 4:1.

Q

What programs did you select to pioneer your initiatives? And why?

A

We looked at a broad spectrum of programs to truly test the tenets of Agile Acquisition. We started with 13 potential programs as Pathfinders, finally whittling them down to six. These programs covered the spectrum from Advanced Concept Technology Demonstrations (ACTDs), to updates to mature programs, to bombs, to software systems. They were the Unmanned Combat Air Vehicle (UCAV), the Small Diameter Bomb (SDB), Global Hawk, the Distributed Common Ground Station (DCGS), the Network Centric Collaborative Targeting (NCCT), and the B-2 Radar Modernization Program (RMP).



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Q

What did you hope to accomplish in the Pathfinder programs?

A

We adopted a “try it and see if it works” strategy. We were looking for two prime results. First, to foster active, cooperative dialogue between the warfighter, the technologist, the acquirer, and the tester. Working as one team—surprises kept in check. And second, to make collaborative spiral development the way we do business. Our timeline was to use Pathfinder programs to develop and experiment with these new processes (six months); capture lessons learned (six months to one year); and finally, to deploy and institutionalize change (one to two years).

Q

Did you accomplish what you wanted?

A

Bottom line—our goal was to experiment and we met that objective, plus we assembled valuable lessons learned that will help guide future programs.

Q

What did you learn from these programs?

A

This is a long answer! As we expected, warfighter involvement with the acquisition community led to benefits. Three programs—B-2, Global Hawk, and the NCCT—showed the promise of this initiative. The B-2 Program built credibility with Air Combat Command (ACC) by resisting going down the same old requirements path; rather, they created mutual expectations of what was realistically achievable. Again, they did an excellent job of managing both risk and expectations and working with the warfighter to collapse a two- to four-year requirements trade process into nine months.

The formation of HPTs [High Performance Teams] was effective for Global Hawk and NCCT. Results: the update to the Global Hawk moved through the HPT to a final document to the Joint Requirements Oversight Council in six

months—a significant improvement over the one-year plus usually associated with this type of effort.

For the NCCT program, the timing was right to act as a test case for writing the new “capability-based” requirements document. An HPT was convened and successfully wrote an IRD [Initial Requirements Document—now called an Interim Capabilities Document]—in one week. The IRD was approved by the AFROC [Air Force Requirements Oversight Council] on February 20, 2003. We also found that having a dedicated point of contact, in this case a support contractor at Air Combat Command, provided a conduit for the SPO [Special Program Officer] into the requirements community. But I must state a caveat: the individual must have credibility within the warfighter requirements’ organization.

Q *One of the troubling issues in acquisition has always been transition of technology from the labs to a program. How well did the tech transfer initiative work?*

A While the collaborative requirements initiative was probably a “double,” this was a “home run.” Four programs—UCAV, SDB, Global Hawk and B-2—showed real promise. I must also pass kudos along to AFRL [Air Force Research Laboratory] for stepping up to this initiative. They formed a strong partnership with all four program offices and their contractors.

For UCAV, AFRL realigned resources to meet near-term and future needs, specifically for the air vehicle area and for automated aerial refueling to increase range. They also built an integrated technology development and transition plan.

In the SDB program, AFRL went even further and collocated three individuals with the program office. Benefits went both ways. First, the lab had a technology effort called the Small Smart Bomb. Collocating lab personnel from that program into the SPO made it easier to see

DR. MARVIN R. SAMBUR ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION

Air Force Service Acquisition Executive

Dr. Marvin R. Sambur is Assistant Secretary of the Air Force for Acquisition, Washington, D.C., a position to which he was confirmed by the U.S. Senate on Nov. 8, 2001. He is the Air Force’s Service Acquisition Executive, responsible for all Air Force re-



search, development, and acquisition activities. He provides direction, guidance, and supervision of all matters pertaining to the formulation, review, approval, and execution of acquisition plans, policies, and programs.

Sambur has more than 33 years of experience in high-technology program acquisition, management, and engineering, focusing on advanced wireless communications systems, sophisticated satellite payloads, air traffic control systems, and electronic warfare.

Prior to his appointment as Assistant Secretary, Sambur was the President and Chief Executive Officer of ITT Defense, responsible for the management of ITT’s \$1.5 billion defense sector.

Sambur holds a bachelor’s degree in electrical engineering from City College of New York; a master’s degree in electrical engineering from Massachusetts Institute of Technology (MIT); and a doctorate in electrical engineering, also from MIT.

In 1999, he received the Golden Apple Award for outstanding commitment to improving public school education for the children of Allen County in Fort Wayne, Ind. Other awards include the Institute of Electrical and Electronics Engineers (IEEE) Centennial Award for excellence in engineering management; induction into The City College of the City University of New York Athletic Hall of Fame; and the Institute of Environmental Management and Assessment (IEMA) Outstanding Leadership Award.

Professionally, Sambur is a member of the Acoustical Society of America, Tau Beta Pi, and Eta Kappa Nu.

opportunities for transitioning technology to the SDB.

These same personnel were also able to piggyback on another lab program that garnered important testing data on SDB components. AFRL received a reciprocal benefit: the close working relationship established with the SPO provided

insight to penetration test data in support of their lab projects.

In addition to collocating personnel in the SPO, the lab focused on specific program needs and dedicated \$8 million of FY03 funding for technology efforts. Global Hawk and the B-2 became “preferred customers.” The labs match their

capabilities and resources to the program's needs. For the B-2 the labs refocused the technology efforts to provide opportunities for follow-on spirals, along with technical assessment of TR [transmit/receive] modules and AESA [advanced electronically scanned array] producibility.

Q
What about the testing initiative?

A
The old approach had AFOTEC [Air Force Operational Test and Evaluation Command] getting involved with the UCAV program in 2005 when the low observable vehicles would be available. Under this initiative, they joined the UCAV pathfinder team to help identify opportunities for operational assessments during the UCAV tech feasibility and military utility demonstrations.

In the SDB program, some members of the OT community fully embraced the seamless verification initiative. AFOTEC (Detachment 2) assigned a representative to the program office—there is an OT desk in the SDB SPO. The actual operators from the 53rd Test Wing became involved in the program to provide direct feedback/advice on the feasibility of requirements implementation. And even the OSD Live Fire test community embraced the seamless verification initiative. Their goal was to have no unique live fire testing.

Even though The Global Hawk program is still in its early stages, working as a team they were able to apply the seamless verification concepts to the TEMP [Test and Evaluation Master Plan], and it has been approved by all stakeholders.

Q
What problems did the pathfinder programs face? What type of hurdles did you run into?

A
Let me highlight a couple of examples. Like all teams, the NCCT HPT learned that while using an HPT may shorten the writing process, without representation from all stakeholders, the coordination process can drag on. Secondly,



We are used to compartmentalizing things—processing paper in a serial fashion and remaining in our own function. We want to move from compartmentalization to collaboration.

it is important to make the contractor a part of the HPT, if possible. When in a sole-source environment, early contractor involvement should be the norm. Industry can help us to understand the art of the possible and can prevent, to some degree, the temptation to overstate specific requirements. Early involvement also gives the contractor a head start on understanding customer

expectations and what capabilities are important for the system. Finally, not everyone embraces these initiatives. While the senior leaders do, not every staff does.

Q
Did you learn anything else?

A
I expected to discover some impacts from the Agile Acquisition initiatives on the acquisition process, but like any test, you often identify other problems. The test identified problems, specifically, in the implementation of Evolutionary Acquisition strategy.

What happens when you have two competing contractors? The SDB program had this question. The first problem was to keep a baseline to evaluate separate proposals when the Request for Proposal allowed flexibility for the contractors to move program content between spirals. Secondly, the contractors were only allowed limited participation in the requirements generation process, and that was restricted to reviewing the requirements and commenting on their feasibility. However, to guard against giving one contractor an unfair advantage over the other, the program office had to be careful to ensure requirements were not changed as a result of those reviews.

The Global Hawk program had slightly different problems—how to match the production program with the use of approval milestones or decision points like LRIP [Low Rate Initial Production] and Full Rate Production in light of the alignment of a program's spirals. If a program is on a schedule of a new spiral every year, it will not fit into a customary milestone process because of either lead times or production quantities.

Funding and budget stability is a “normal” acquisition problem. But moving to spiral development will challenge how we budget for programs. Some Pathfinders—SDB, UCAV, and Global Hawk—are already impacted by budget instability. And although the 5000 directive specifically allows programs to move into SDD [System Development and

Demonstration] directly from an ACTD, the budget process isn't able to handle that transition very well. This makes it imperative to work closely with the programmers and budgeters in the Pentagon when contemplating this sort of move.

The DCGS program had a test-related success story with the removal of "seams" between testing organizations by combining security and program test and evaluation, which significantly cut costs and reduced time.

There are other benefits, and one that is having the impact we wanted was on the SDB program. Its use of "Commander's Intent"—a clear statement by the leadership that reflected the necessary outcomes of the program—focused answers to questions/approaches introduced by organizations not in the accountability chain. The statement ensured the program remained focused.

Finally, one that I put into the fallout category of collaboration: we learned we had a "hidden" source to help us on the DMS [Diminishing Manufacturing Sources] problem. The labs have the capability to be our "honest broker," evaluating contractor assessments of DMS issues.

Q
What is the status of the Pathfinder Program?

A
It was time to put into practice what we had learned. I concluded the effort and asked the ACE [Air Force Acquisition Center of Excellence] to gather the lessons learned and promulgate them. It was now time to implement across the Air Force.

Q
How will you institutionalize these lessons? What policies will change? When can the Air Force expect changes?

A
The acquisition policy part is easy. We are in the process of issuing a new Air Force Instruction 63-101, which will

incorporate the Agile Acquisition initiatives. But these initiatives cover more than core acquisition issues. My staff, particularly the acquisition professionals in the ACE, are working in collaboration with the requirements folks [AF-XOR] and the testers [AF/TE] to jointly develop our three instructions that govern how we perform acquisition. These initiatives need to become a part of the normal process and will have to be tracked to determine their degree of success.

In the ACE, I have put together the right people and the right mix of people to drive real change. This will be the hard part for them—helping to change the culture. We are used to compartmentalizing things—processing paper in a serial fashion and remaining in our own function. We want to move from compartmentalization to collaboration.

Q
That ties directly into our next question. You have indicated in testimony before Congress that you have been working to develop processes and enhance the culture within the Air Force acquisition workforce, so as to institutionalize these changes. What specifically do you plan?

A
Much about what we have talked about has been to identify the impediments to cultural change—to break down barriers between organizations and work collaboratively together. We will establish processes that foster a culture change called "collaboration." Once more, I have tasked the ACE to get the word out, to identify obstacles, and to help remove them. Again, it will be management's responsibility to ensure a focused effort on cultural change and then to institutionalize.

There are other problems that have been identified in the acquisition system that we are also addressing: faulty cost estimates, inadequate systems engineering, and unstable funding. I have addressed the issue of faulty cost estimates by instituting policy changes that will foster credibility within the acquisition community. In the past, we have designed

our programs with a 60 to 70 percent confidence level of meeting cost, schedule, and performance goals. In order to be credible to both the warfighters and Congress, I have implemented the use of a 90 percent confidence level in meeting our requirements. This will improve our cost estimating, help budget instability, and increase warfighting capability.

We also need to instill an adequate systems engineering foundation within the acquisition process. Systems engineering is one of the bedrocks of sound management for acquisition programs, as it ensures that contractor-proposed solutions are consistent with sound engineering principles. Decisions based on a solid systems engineering approach will ensure our program managers will be better prepared to assess their programs' health and will help to keep programs on budget and schedule.

As such, I am implementing a process by which all future Milestone Decision Authorities will ensure that future Acquisition Strategy Plans focus attention on good systems engineering. Additionally, I am driving a requirement that systems engineering performance be linked to the contract award fee or incentive fee structures. This link will help ensure the industry will also follow a sound systems engineering approach.

Q
What are your concerns with the realization of your Agile Acquisition initiative?

A
It is premature to declare success until the results of these initiatives are realized. The initiatives enjoyed top cover and visibility. Will the system allow these changes across the board to match the success of the Pathfinder programs? I will personally track the ability to maintain this commitment by all parties during the follow-on period. I am committed to making this work!

Editor's Note: A complete overview of each program is available at <http://www.safaq.af.mil/ACE> (case sensitive).