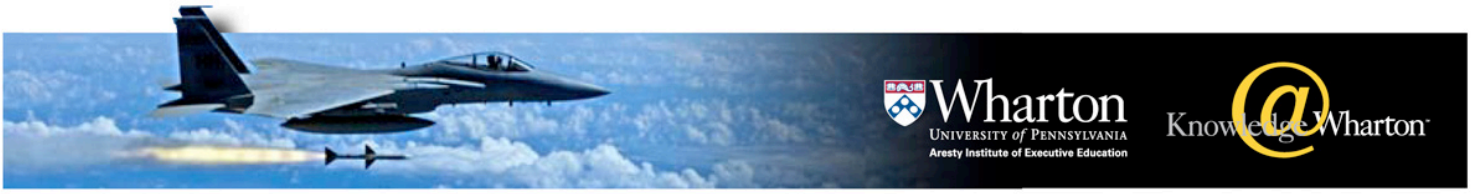

WHARTON AEROSPACE & DEFENSE REPORT
Your Knowledge Source on the Aerospace & Defense Industry

An Interview with Marion C. Blakey, president and CEO of the Aerospace Industries Association:

The Prospects for Space Exploration, Rising Global Competition, and the Defense Department's New Approaches

August 7, 2009

The *Wharton Aerospace & Defense Report* recently spoke with Marion C. Blakey, president and CEO of the Arlington, Va.-based Aerospace Industries Association (AIA), about the prospects for space exploration, global competition, UAVs, and the U.S. Defense Department, which is entirely re-evaluating its needs in fighting systems and how to structure the acquisition process.

Until 2007, Blakey served a five-year term as the Administrator of the Federal Aviation Administration, where she regulated the nation's airways and operated the world's largest air traffic control system. She also helped launch NextGen the shift toward a satellite-based system that hopes to modernize air transportation and decrease delays.

The *Wharton Aerospace & Defense Report* asked Blakey how the U.S. aerospace industry could maintain its edge in innovation, where manned space travel fits into the picture and what role unmanned aerial vehicles will play going forward.

An edited transcript follows:

Wharton Aerospace & Defense Report: We are celebrating the 40th anniversary of the first moonwalk -- a mission driven national zeal and focus. Today, it seems that only disasters draw public interest. What think needs to be done with reignite the public's imagination when it comes to space?

Blakey: I think the most important thing in terms of our commitment to space, which I believe is an absolutely critical frontier for any major nation much less the United States, is national leadership. Remember that we got to the first step on the moon because President John F. Kennedy years earlier had said that we are going to make a commitment to get there within a decade and both seized the public's imagination as well as galvanized the resources. That is what we need again and I do think it also helps to have these moments, such as we just had with 40th anniversary of the moonwalk, to put a punctuation point on things, and look at what we achieved and at the gap we have had since then because I think the public, at times, believes we are just going along and making progress. And we are not making uniform progress when it comes to space and we need to do much more.

Wharton Aerospace & Defense Report: When it came to the moon missions, the underlying tension at the time, of course, was the cold war. That was one of the galvanizing forces. Why is space travel and exploration critical today to the United States especially as Europe, Russia and China are also focusing on the aerospace programs?

Blakey: Most fundamentally I think, in asking the question 'why is space important to the US?' one should look at America during the last century and ask, 'why was the shift West in exploring the frontier beyond the Mississippi important? Looking back, it's a no-brainer. We all know that that was an absolutely fundamentally

important shift for this country that put us off on a trajectory we could not have been on under any other circumstances.

I think the same thing is true in terms of exploring space. And by that I mean it is a frontier that, as we know more about it, we will know much more about the benefits, the opportunities, and what it will teach us from both a knowledge and a technology standpoint. All those things will go to our economic and societal benefits that no one can know yet but we can see the beginnings of them.

One of the things that I find most exciting right now about the international space station is they are doing medical experiments there that address very important problems we have daily in our hospitals regarding staph infections. They are making great progress on a breakthrough there and they are addressing the problem of salmonella in our food stock. Those are things that help immediately but there is always the frontier.

And then of course there is the security angle issue, which is why we did get into the race to the moon 40 years ago -- a very valid reason. Our national security does depend on having space assets and having the ability to use those assets to surveil, to observe and if necessary to be able to respond to threats. That is all a part of it and those who control territory in space will have a natural advantage over all the others.

Wharton Aerospace & Defense Report: Given the expense of space exploration are we likely to see more joint efforts between nations. What are some of the benefits for international cooperation at this level and what are also some of the possible problems that can occur because of this international cooperation?

Blakey: When you think about the fact that the race to the moon was inspired very much by competitive threats, by concerns about who was besting who. And certainly there was no effort to stretch out a hand in those days. I think we could see that competition has its benefits. But international cooperation I believe has even more [potential]. This is a point in history where we have the opportunity to collaborate with a number of countries, some such as Russia, that were very much our adversaries in a previous time.

And it is not only a question of being able to combine resources and therefore together do a great deal more that we could if we were all relying on individual state assets. It's also the collaboration, the ideas, the way the cross fertilization can go on in an international environment, which means that space could really a game changer in terms of relationships among nations. And that is a huge benefit in and of itself.

Now does it have challenges? Yes, of course. Anyone who is involved in an operation where you have to get consensus knows that at some time it can knock a few corners off what you like to get done. You may not be able to set the same agenda that you might if you had full sway in the situation. But overall

[collaboration] is a [net] benefit – absolutely and I do believe that the catalytic nature of minds from different cultural backgrounds with different educational assets, different technologies, all of this coming into play makes a very exciting mix for breakthroughs in term of exploration and what we can do together.

Wharton Aerospace & Defense Report: As NASA prepares to retire the shuttle suite what does the AIA envision as the ideal replacement?

Blakey: Our ideal replacement is one that will get us back into space with our own launch capability as quickly as possible. We really are not in the position of trying to second-guess the administration and the new commission that is headed out by Norm Augustine [Link: http://blogs.airspacemag.com/daily-planet/2009/05/08/nasa-needs-direction-call-norm-augustine/]. They have got some pretty impressive minds thinking about that question.

But we as an industry believe it is very important that we not dawdle, that we not begin to lose ground and that we really address the challenges of, not just the kind of launch capacity that we have had getting into lower orbit and maybe back to the moon, but we should keep our eyes on the prize. And that is Mars and beyond, and so for launch capability there -- we are looking for it to have long-term benefits for us.

Wharton Aerospace & Defense Report: In light of the delays and cancellations of the Boeing 787 Dreamliners, and some of the other financial pressures on the commercial aviation industry -- Continental Airlines just announced a big round of layoffs -- how is the aerospace industry in general positioning itself to weather this downturn?

Blakey: There is no question that like all manufacturing industries, we are on a rough patch right now. But we are better positioned than most frankly to get through this. Is it turbulence? Yes. But this is not a situation where we are headed on a dramatic downdraft at all. The reason I say this is several-fold. First, there is a very substantial backlog of orders. Even with cancellations and deferrals coming in this year that does give a significant cushion for our industry and it is something that has been built up on the basis of excellent technology.

When you look at Boeings' book of orders alone and you realize that they have a constant commitment to improving aircraft like the 737, which right now has a backlog of over 2000 aircraft. I mean that is formidable. You look at the 787 there you talk about cutting edge composite technology a tremendous environmental benefits and of course with that goes a lot of economies for the airlines because it burns a lot less fuel. There again you are talking about a backlog of over 800 aircraft right now. So the industry can survive well on that kind of substantial foundation.

It is tougher in the business jet arena and in general aviation. But that too will come back as time goes on and of course there is balance with many of the

airframe and parts manufacturers of the military assets that are being held on as well.

Now, this industry went through a very rough patch back after 9/11. This was particularly a period that was hard on aviation and aerospace and as a result our companies did a great deal to bring down their debt, to establish a very streamlined operation to make the kinds of cuts and changes that in other parts of the economy, companies are now having to do for the first time in a long time. But because we did position very well to get though that period you find companies now, as I say, have the kind of efforts and the kind of organizational backbone that will drive through this period I think very effectively.

Wharton Aerospace & Defense Report: The U.S. aerospace industry is one of just a few sectors that give the United States a trade surplus. How does the industry maintain that as more companies across the globe start entering this sector?

Blakey: Well I think that you know again that U.S. technology is the gold standard in so many ways around the world and I believe it will continue to be. The fact that we had a $57 billion trade surplus -- the largest by far of any manufacturing sector -- tells you a bit about the fact that we are very strongly positioned as time goes on.

And certainly there are both airlines and countries that are going to be looking to buy -- countries like India, which wants to buy more fighter aircraft. Airlines are starting up in other parts of the world where they continue to maintain their plans for a very robust growth pattern. So we think that the market is one that is going to play to the U.S. strengths. At the same time, I think we all believe too that we are going to have to continue to scramble and continue to innovate to maintain that technological edge as well as just the overall soundness of our manufacturing.

I also would say this: we are working to position ourselves on issues that have been difficult for the United States for some time and by this I am referring to the kind of controls we place on exports, which are very well intended because they address issues about why our technology is so much stronger and how it would be a national security loss or threat if we exported it. Those kinds of controls and licenses that are required are certainly an important part of the way we do business. But it is time to update what we consider to be technologies because we are preventing many of our export advantages unnecessarily where the technology is being sold widely around the world and yet we are not enabling US companies to be in those markets. One of the best examples of this is in commercial satellites, where about 10 years ago we had 70% of the worldwide market.

Our percentage share now is down in the 20's because we placed strict controls over what could be exported and much of it is commercially available, and certainly 10 years have gone by and it's time to scrub that list, it's time to change the way we do business. And we are seeing the congress stepping up to this. There is a bill that has moved to the house and one that is coming in the Senate. We believe is

going to address those kinds of issues that will help us maintain our positive exports bounds.

Wharton Aerospace & Defense Report: Airbus continues to receive subsidies from its member nations that allow the company to conduct what basically amounts to risk free R&D. Meanwhile, Boeing and its stakeholders have to take on that risk when they do research and development and that is not a level playing field. How does the AIA see this issue being resolved over the coming year or two?

Blakey: The issue is coming to a head in the courts because the trade case before the World Trade Organization has been pressed by Boeing and a counter suit has been pressed by Airbus. Both are under active consideration and we understand that a decision is likely to come in the relatively near future. So I think what we should do is see how the courts adjudicate this and then see what may be the appropriate things to advocate and the steps to take. But I think at this point we will wait to see what the WTO says and go from there.

Wharton Aerospace & Defense Report: You mentioned the advantage the United States has when it comes to innovating technology and research. Unmanned aerial vehicles (UAVs) -- like most innovative technologies -- came out of smaller shops rather than some of the big aerospace company hangars. What role does the AIA play in supporting or nurturing some of these smaller ventures where perhaps a lot of the innovation or some of the innovation is coming from?

Blakey: The Aerospace Industries Association, the AIA, is a 90-year-old trade organization. So you can appreciate we had a very strong role to play back in the days when planes were few and far between biplanes. One of our founders was Orville Wright. So we have played a great deal in nurturing the birth and the growth of aviation. Same thing has been true in terms of military technologies, as time has gone on. And I think we are going to play a very important role with the growth UAVs as this is all developing. We have set up a very special focus within our organization where we are focusing on this from the standpoint of how do take what often are military systems and begin to give them access to the civil air space.

Now we all agree this is a situation in which, as the medical profession would say, we want to do no harm. We want to safely introduce these systems. But they have great advantage for some jobs, particularly jobs that are dangerous, are dirty, are repetitive, and are boring. All of those are situations in which you don't want to put humans in harm's way or where they may not function at their highest potential.

So that is what we see as being the importance from the standpoint of our overall system of UAS (unmanned aircraft system) and, it is, of course a growing market with the innovation there. I think we probably haven't seen anything like what it's going to do for us.

We also have within the AIA a focus on small businesses. We have in fact the council of 170 companies that are mostly small businesses. It is a subset of our group. So we take into account not only how the large companies and how our history and experience can advance new technologies, like the UAV explosion that we are seeing. But we also have the kind of opportunities across companies the same size to share experiences, to work together and to work on even generic issues that small businesses face – such as how to get R&D money.

But, importantly, we are working closely with both the civil aviation administration and with NASA and with department of defense. Being here in Washington, we are uniquely positioned to help set the protocols in civil airspace, and to get the standards that everyone has to manufacture to and perform against so that we know that they are going to be most efficient and safe as this change comes, because it's coming and we regard it as a very exciting prospect.

Wharton Aerospace & Defense Report: When you talk about these unmanned craft, some of the uses are for drug traffic surveillance along the US border, forest fire detection, firefighting and search-and-rescue missions. As UAVs begin fly the domestic skies more often, we are going to have to depend on some of the new technologies -- like the Next Generation Air Transport Systems -- for monitoring aerial traffic. How is that progressing and what barriers are there to its implementation?

Blakey: Well the NextGen Air Transportation System or the NextGen as we all call it these days will I think offer an optimal environment to introduce new aircraft types and new capabilities in the system because it's a completely different system. It is essentially moving from the approach that has been in place for many, many years for using radar to have aircraft move across fixed patterns in the sky much like highways. A lot of these were laid out -- these were laid out back when they used to fly the mail following highway routes and following bonfires farmers would build at night from one spot to another.

Needless to say that is not the most efficient trajectory but that is the way the system has been constructed and works ground based navigational aids. Now it's time to convert to what most of us take for granted in other parts of our life and that is using satellites, using GPS, using the ability to navigate with a absolutely optimal trajectory, and with great precision so that you can have therefore a much more efficient system -- one that builds in digital technologies and capabilities. That means that new systems like UAS or UAVs would be able to be built into the plans at this point. Because, again, we really are in a game-changing environment.

Now we think that the NextGen blueprints are in pretty good shape. We know what the new technologies are going to be to make a system like this work. But we do believe that it is time to step up the pace on getting it done. They have set some deadlines so that we are not stretching this out well into the 2020 range but bringing it in close to the next three-to-five years when we all begin to see the benefits. Because the way the NextGen will work, you will have much greater efficiency, which means you will have less environmental impact from the emissions

and noise, and at the same, time less fuel burnt because this is will allow for more straightforward flights and flight patterns. You will also have what is called continuous decent approach which is almost like coming from altitude down to the airport service using a glide-path, rather than the kind of approach we usually take of throttling up and throttling back. Anyone who has listened to the engines as you come in on approach to an airport knows that it doesn't sound particularly efficient -- well it's not. And the change in the way we fly is going to mean that you have those kinds of benefits plus additional safety built in the system.

So from a economic/environmental/safety benefit, all of those things argue for investing in the NextGen infrastructure in the same ways we are investing in surface infrastructure -- whether it's high-speed rail, or highways or bridges. It is time to look at aviation infrastructure in the sky in the same way and make a national investment that is required to step this up and get it done because we do know where we are going and we could get there a lot quicker if we make the kind of commitments that Congress and the Administration need to do. If there is another stimulus bill, that would be a great time to bring some of the shovel-ready projects into the aviation infrastructure the same way we are doing it in the other parts of the economy.

Wharton Aerospace & Defense Report: Is spending one of the barriers right now that has kept it from moving forward or are there also entrenched players within the industry that would like to keep the status quo?

Blakey: Most of the debate within the industry has focused in the past on the question of who pays. So it's an economic barrier. It's a question of, among the users of the system, who needs to pay the most to build this new infrastructure. Remember, this is an additional capital investment beyond just being able to pay to operate the system keep or keep the existing one going while you build a new one. So it's been a significant barrier.

But I think that the industry has very much looked at the change of our economy and the change in the way that this administration and the Congress have approached infrastructure and said – look, let's have the political will here to make the investment in this infrastructure as well. And then let's start watching the payback. That is not a barrier coming from the industry, it's simply that we have to have to have the Congress and the administration step up on this and we are increasingly seeing a willingness to do it.

Wharton Aerospace & Defense Report: The defense acquisition system has been in need of a major overhaul for some time now. There is shortage of skilled acquisition officers and there is another entire generation of experienced workers who will be retiring soon. And that puts projects behind schedule and can lead to budget overruns. What are the AIA's top few recommendations to bring about a fair and effective reform in to this system?

Blakey: Well our industry is very much of the view that we do need to improve the system of acquisitions in a way that will deliver greater value than even we have to this point. Because remember, we have delivered an absolutely technological marvel when it comes to the United States ability to fight effectively and to keep our men and women in uniform out of harm's way. I mean everyone acknowledges that it has been a incredible achievement on the United States part through two world wars and to the present day -- that we have an unlevel playing field -- and it's because of the technologies that the system has brought to the forefront have worked superbly.

All of that said, when there are cost overruns and when there are schedule slips, and when people see problems that occasionally do come up on these new technologies, everyone says we can do better and we think that as well. We think it needs to start at the very beginning with set the requirements very clearly and accurately. This is not always easy because you have different views on the part of services sometimes and you have different views on the part of Congress in terms of expectation. We need not only to set clear requirements in the beginning but on the part of industry and of government to look clear-eyed at what the costs are going to be and set accurate cost estimates, not things that are, "wish we could, we hope," but estimates that we believe will hold.

Then it's a question of having a sustained stable budget to fund it because the ups and downs in the defense budget cycle have been terribly damaging to a number of these programs where there are hold-ups and slowdowns all of a sudden. A plan that was intended to deliver a certain number of unit costs is cut in half and that means those unit costs go way up and the cost of the overall program does. And, of course, the longer the program goes on, the more you do see legitimate changes in requirements. After all, if a program is 10 years old and an aircraft that was designed in the 1990s is going to have new technologies by time you get to 10 to 15 years out.

So trying to keep a efficient schedule to deliver on time also helps on the cost run as well but it's important too at the end of the day in addition to having stable steady budgets to support this that you do keep a careful eye on requirements because the requirements –something's are very important and should change. Something's one should probably hold to the original or close to the original plan if you don't want to have the schedules go off track.

And all of that we think could be helped by the plan that this administration has advanced and that is to increase the acquisition workforce for the Pentagon. They do not have the personnel. People with contracting experience, acquisitions and procurement backgrounds, who are able therefore to handle the overall requirements of what are technologically very sophisticated systems.

So those are the kinds of systems that we think can be made. But remember in all of this that you are talking about going where no one has gone in many of these kinds of new systems. And inevitably there are aspects in any developmental program, any R&D that goes into this that are going to shift change and can cost

more and we also have to accept that if we want to have breakthrough technologies there are going to be those times when we have to say, "Yep, we have to dig deeper to make it work."

But at the end of the day as I say it has advantaged us as a country and kept us a very secure nation.

Wharton Aerospace & Defense Report: The materials can improve. The hardware, the software, the electronics can improve so there has to be some leeway built into that as time passes on some of these contracts.

Blakey: There are very few examples in manufacturing where the beginning of a new aircraft or a new product is going to start 20 years before it's actually going to take off for the first time off a runway. That is the case in aerospace. There is a very long ramp up on some the systems.

Not all, but many.

And that does put particular challenges when you are talking about acquisition reform and how do you address that because it's not the same thing as building an automobile or building a piece of machinery. It's a very different challenge and that does mean that we have to stay on a consistent basis how do we improve or recognize that it's a different enterprise than almost any other.