

"Living with an Aging Air and Space Force"

General Donald Hoffman
General Gregory Martin
General Thomas Moorman

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Moderator: I'd like to introduce our panel members.

First of all, General Donald J. Hoffman is the Commander of Air Force Materiel Command. He's a graduate of the Air Force Academy, has served on the staffs of U.S. Central Command, U.S. European Command, Air Education and Training Command, and Air Combat Command.

General Gregory S. Martin, some of you may know as "Speedy", is a retired command pilot with more than 4600 flying hours in various aircraft including the F-4, F-15, C-20 and C-21. He was the Commander of Air Force Materiel Command and the Commander of U.S. Air Forces in Europe.

Finally, General Thomas S. Moorman, Jr., U.S. Air Force Retired, was the Vice Chief of Staff. He was also the Commander and Vice Commander of Air Force Space Command. General Moorman was responsible for operating military space systems, ground based radars, missile warning satellites, as well as maintaining the intercontinental ballistic missile force.

We'll ask General Hoffman to begin with his remarks, then General Martin, then General Moorman. Gentlemen?

General Hoffman: Good afternoon, and thank you for this opportunity to talk about this topic.

When you say the "aging air and space force" I guess you could think about airplanes and spacecraft, or you can think about people, because it's a force. One is definitely aging.

I had a similar conversation down at AFA Symposium, Orlando, so I don't want to repeat what I said down there, but if you talk about the aircraft, most of you realize we're at 24 years average age, the highest it's ever been in the U.S. Air Force. Spacecraft, they're aging up there in space. The good news is they've worked longer than we ever thought they would.

You can think about other aging factors, too. The infrastructure, the industrial base, those are all good questions to ask. But the one thing that gives me optimism,

no matter how all those forces are aging, and that is the vitality and enthusiasm and energy of the people force. No matter what we do, whether we sit around in our cubicles or in our meetings rooms, headquarters and all that, or venues like this, when you get out there where the rubber is on the ramp and activity is actually being done, you see great Americans doing wonderful things, in many cases with old equipment. I think we owe them better than what they got. We as a nation.

Many retired folks out there in the audience, your nation gave you better, newer equipment at least, and we went through cycles there post-Vietnam, et cetera, where it was pretty dismal. But our nation owes those, especially when there's a shooting war going on, we owe them I think the best that the nation has to offer and we're certainly not doing that right now.

On the air side, AFMC obviously has the role for the Air Force of sustaining those aging aircraft. We've got the three depots out there. They've gone through many years of lean process used to turn those aircraft faster and smarter. And indeed, we did a lot of reductions to the flow days. We increased aircraft availability.

As I said, in February, if you think of the depots as a geriatric hospital, they're getting very very good but the patients are coming in sicker and sicker every time.

We have a bunch of initiatives. I'll be glad to talk about those in Q&A, but we find our flow days inching upward because of the sickness of the patient coming in, if you will. We have some initiatives to address that, but they are inching up.

I think what concerns me, and I haven't talked about it publicly that much, and that is our nuclear enterprise and the aging of certain parts of our nuclear enterprise. We in AFMC now have the lead role in the sustainment of that enterprise. General Moorman, you put in place a lot of Minuteman III modernization activities that we are now closing out on -- a new propulsion system, new guidance system, and so forth. We were given the task to take that fleet to 2020. If you ask me my confidence in that fleet responding to 2020, I'd have one set of confidence factors, but we've now been given the task of looking to make it stretch out to 2030. My confidence in that is considerably less.

In all the things that we've done on both the ICBM side, on our gravity bombs and our cruise missiles, what we haven't gone into is the actual bang for the buck inside. That is our reentry system, the packages that we work with Department of Energy on. Those need addressing. They are

aging. We're in our second or third design life and we as a nation, as we go through national nuclear posture review, as we look at arms control and so forth, I see a different future emerging from that as far as what we do with our nuclear deterrent. But I'm convinced at the end of all that that we still will have a nuclear deterrent and we need to have high confidence that it's safe, secure and reliable. So there are some aging factors in there that will need national level attention.

I've toured all the Department of Energy production facilities where they used to make but now maintain and where they sustain the nuclear enterprise in the infrastructure there, in the human capital there, is all aging as well. So that will take a national level investment for us to have confidence in that nuclear deterrent as we go a decade or two into the future.

People also talked about, a concern to me, in keeping that human capital engaged. It's one thing to cancel programs, but then when you look at the second and third order consequences of that you find the human capital going away as well, both on the government side and on the industry side. So that impact of aging, if you will, and expertise on aging goes with it.

I think with that I'll close and let the other two panelists talk. I'll be glad to take any questions on any of those areas.

General Martin: Thank you all, it's good to be here. And thank you for helping us think through this problem.

When I first saw the timing of this, from 2:50 to 3:35, I put together a 45 minute pitch, so let me read it to you. [Laughter].

Actually, hopefully about 10 minutes here.

I thought I'd take a look at this pitch from two perspectives. First, and probably most important because as General Hoffman just said, it's always good to have an optimistic or a positive approach to a problem that you may find yourself in. So the first part of this really is how to not get into the position of having an over-aged force. Then in the second one, what do you do when you do have such a force while you're trying to dig out of it and get into that more positive approach of sustaining a force structure of a much lower average age.

First, how not to get into that situation.

Until the end of the Cold War, the turn of technology and the advancements in propulsion, materials, and aerodynamic design I think argued for a fairly rapid development of new aircraft and weapon systems which also resulted in fairly short production runs, but relatively high production rates for that production run period.

An example. If you take the 45 year period between 1949 and 1974, the Air Force alone developed the F-80, the F-84, the F-86, the F-89, the F-94, the F-100, the 101, the 102, the 104, the 105, the 106, the F-4, the F-111, and the A-7. And a bunch of prototype X types, and the Navy did similarly. So we were really turning out a lot of airplanes pretty fast. Each of those systems resulted in hundreds, literally hundreds of aircraft being built, and the outlier of that really was the F-4 which had a production run of about 14 years, versus 2 to 5 years of the other variants, and they produced 5,000 F-4s over a period of time.

In fact I remember when I checked out in the F-4 in 1971, my squadron commander got us all together and said now you guys are flying the oldest F-4s in the inventory. These are F-4Cs, they're the oldest we have. You better learn your TO Section 3, emergency procedures, by heart, because you're going to use it a lot. Those aircraft were eight years old. Our fighters today are in the 2-24 year range, three times as old. We thought eight years old was really old in those days.

Now between 1974 and 1979, that 25 year period, we built and fielded the F-15, the F-16, the A-10 and the F-117. So you can see that there was a difference in the way we approached the problem of designing and building our primary tactical fighters. The same can be said about airlift, bombers, and that.

Our procurement strategy initially was very very short production runs, high production rates. We ended up as a result with a fairly significant industrial base that was robust. Competition was strong. And the pace of development was really quite extraordinary.

In the '80s we began to see that transition but we really didn't recognize its implication and transition to a different production strategy, even though I find it really astounding, if you think about what I said at first, that we're not only still flying the F-16 and the F-15 -- we're still building them some 30-odd years later. But we didn't take advantage of the fact that we would have long production runs and perhaps reduce our average procurement rate to a sustainable number that doesn't get everyone excited, but by the same token continues a production run for quite some time, such as we found as a result of the F-15 [inaudible] program, the block program in the F-16. Most

of our aircraft were bought at that old procurement strategy and then we kept the lines alive for primarily foreign military sales activities with some of our partner nations.

Now as a result we find ourselves with old aircraft, low production rates to replace this aging force with aircraft that are increasingly more expensive, an industrial base that is not robust, and really does not offer much competition. That's, in a very short period of time, a fairly significant turn of events.

Now the long term answer, in my view, is to look at long production runs and the block approach that allows you to have warm production lines. I think you get the benefit of that time for continual competition in some of the sub areas, if you had a dual buy strategy, as we had, as many of you know, in something like an AMRAAM. You know that you can continually drive the price down. But if you can't do it in the prime at least in the subs you can have a continual competition in things like radars, avionics, engines, and that sort of thing to continually drive the price down.

How much should you be producing a year? It's really pretty simple math. If you think a fighter should last about 20-25 years, and most people think that's about right, or an airlifter, bomber, tanker, about 30-35 years. It's pretty simple to figure out what it will take to produce an aircraft at a certain rate to maintain that kind of average age.

For fighters, that's going to be about 100 a year, and if the fighter reductions that we're talking about go through, it's going to be somewhere about 80 a year. For bombers, airlift and tankers, that's probably about 30 a year, forever. Not peaks and valleys, but continual development there.

What that means then is you have strategic partnerships with your subs, you have a continual engineering and design base, or teams that are helping your industrial base issue.

The problem now is that if you take that formula that I just gave you, we will still not be able to recapitalize that force without having 80 year old tankers and bombers 40 year old fighters. So the answer might be that initially you have to go a little higher to start the process working, while at the same time you work the aging problem that we talked about earlier, and I'll give you a couple of thoughts on that in just a second.

So that's why the Air Force I think tried to get their F-35 production up to about 110. There's discussion about maybe tankers, instead of 15 a year, maybe 20-25. Again,

those are affordability issues. But that's about the only way you dig yourself out of the average age hole.

Assuming you do that, you still have this significant aged force that you have to take care of. So how do you deal with that?

First, I think we have to look very seriously at what I call a conscientious effort and funding profile that is proactive with respect to determining what's likely to break, and then making sure that we're working on it ahead of the break as opposed to after it broke as we found with the T-38s not too long ago.

I think the Fleet Viability Board's efforts needs to be accelerated, perhaps robusted a bit and accelerated so that we have a little better grip on the fleets that we have and the likely things that we should be paying attention to which then helps that planning ahead, and building an aging aircraft budget where money is actually put against the kinds of things that will make the biggest difference.

When they finish their efforts I think we need to again take a look at those recommendations and make that a conscious part of our program.

I recall when I was on the Joint Staff, Vice Admiral Art Zebrowski, who later became Secretary Rumsfeld's Director of Transformation before he passed away, used to say when making it look like you're trying to take on a problem and worry about it, people often commission a study. He said you have to realize the study is just one nano-bit away from doing nothing. So over the years Rand, Scientific Advisory Board, the Air Force Studies Board and others have done studies on avionics obsolescence, reengining, linglets, net centricity, aging airframes in general, industrial base, all of those kinds of things. Recommendations come out, and the Air Force has usually not done what they recommended. By the way, it's not like I grew up five years ago when I retired. I was a part of that process because we jam everything into the budget that we can that's new and ready for the next war.

Unfortunately, we find ourselves now having to back up and say aging aircraft is a major program.

My view is if we take a look at one of the most successful reengining and modernization efforts we've had, it was the KC-135R. And just this weekend the C-5M I think set 41 new records with its reengining program. So we know it works, we know it makes a difference, and yet I think we're pulling the plug, at least the papers indicate we're pulling the plug on reengining efforts that were recommended by several of these studies on one of our major airframes.

So those areas I think are important. Next we have to look carefully at the budget that we have continually gnawed away at in the component improvement program for our propulsion. VAIT, which moved from the IPTIP program, very very important activities that give us an opportunity to refresh our systems without necessarily replacing all of them.

I think the Aging Aircraft SPO probably needs to be reenergized along with the AFR and Materiel folks to begin to take seriously some of the new and I think much more precise non-destructive inspection technologies that are available to determine the integrity of our systems -- much like we use that today in the health world. It has application in our aviation industry as well.

We probably need to go back through our organic depots and look at how we can take the Lean tools and the AFSO-21 efforts to the next level because that's what General Hoffman was talking about in terms of part of the human capital is the weight and responsibility we put on the backs of our people at depot as well as in the field for maintaining old aircraft.

Last, we probably need to look hard at simulation and emulation and see where it can be used more effectively to slow the utilization rates down of our equipment without reducing our combat effectiveness.

So clearly I would say that we're in a fix. We can't get well in a short period of time. I think we need to change our long term procurement strategies to allow for warm and hot lines to continue to refresh and modernize our systems at lower production rates, while we dig ourselves out of this hole with some of the ideas that I suggested there that we might want to look at.

Thank you.

General Moorman: Good afternoon. Our topic this afternoon, Living With an Aging Air and Space Force, is an incredibly complex topic, and I'm going to try to get through something here in about five or six minutes, so bear with me. I want to leave some time for Q&As because I find that's the most important.

The thing that I'm going to talk about is satellite modernization. And lest in my speed you miss the point, this is a very good news story.

Let me begin by trying to underscore the similarities between air and space modernization. First of all, space

has its B-52 and it's called DISCUS com satellite. It is, the one that is still providing data is 25 years old. And our tanker is perhaps the DSP which is a 20 year old satellite is still providing data.

This is pretty good in the fact that these spacecraft were originally designed for five and seven years design life. We've achieved this because of robust design, substantial redundancies, and an extensive and some would say very costly mission assurance program.

Like aircraft systems, we've also introduced new technologies through major block changes in spacecraft, and that's been the case in GPS.

The longevity of these space systems and our extensive operational experience with them have enabled us to track the failure modes for components and subsystems, and determine which are likely to fail and design that into the block change. That has really improved the lifetime.

Those are the two major similarities. By the way, we have our operators, and in this case we've got our 22,000 mile screw driver in maintaining these things.

Let me talk about contrast. I'm going to contrast one single area. The major difference between today's air problems, which this audience well knows, problems in modernization, is the scope and rate of change in space modernization.

The current plan which we are well into is to replace the entire, and I emphasize, foot stomper, the entire space force structure with a new generation of satellites, with enormous improvements in capability.

Let me expand on that thought because I'm not sure the extent of this modernization is widely understood.

The first reason for this happening like this has to do with the fact that a large percentage of our current force structure was initially introduced during a relatively small period of time. We're talking about the late '60s all the way through the early '80s. During the intervening time we've had this enormous rate of change in technologies, and here I'm talking about micro miniaturization, and focal plane arrays, and new com systems, and incredible increases in power.

The second reason, which I'm not sure everybody thinks about, but we have seen an enormous and concurrent increase in the demand function. The demand function began, I believe, with Desert Storm. The military, the warfighter, discovered space and now over these intervening almost two

decades, has become comfortable and more importantly, dependent on space systems. Consequently, the priority and demand for space is seen in the budget.

Let me quickly tick off the extent of modernization, and I'll try to limit my acronyms or explain it. I'm going to go very quickly on this, so if anybody's taking notes I'm going to list five satellite systems that are being modernized. DSP is being replaced by SBIRS in two different orbits. We've flown two HEO, highly elliptical systems, and in the era of all this bad news, these two HEO satellites have performed well beyond what we anticipated, such that we're going to have to come up with new exploitation techniques. That's a terrific news story for such an important program.

The DSCUS com satellite is being replaced by something called the Wideband Global SatCom system. Two of these things have been launched so far. The good news here is that one satellite has as much bandwidth as the entire DSCUS constellation.

The third one for protected com, fourth satellite, advanced EHF system. These satellites are going to be launched on one year centers beginning the fall of 2010. They also will provide about a 5x-10x improvement in bandwidth over what you get in MILSTAR.

Our weather satellite system, DMSP, is being replaced by something called NPOST, it's a tri-agency activity. The first one of these things is going to fly in 2014.

Finally, GPS-3, the world's global space utility, is being developed now with improved AJ, with improved accuracy, with improved integrity and availability. First launch here is 2014.

Five systems, all between now and the next five years.

In addition, we're building two first of a kind satellite systems that you don't hear that much about. The first is something called the Space Tracking Satellite System, STSS. It is funded by MDA but the Air Force is developing it. It supports the nation's missile defense system. The first launch is imminent.

The second one is something we've been trying to get launched for years. It's the space-based surveillance system. That's in its final preparation for launch and will tremendously increase our space situational awareness.

I would be remiss if I didn't mention launch. I mention it by preceding any comments on launch with a knock on wood.

The government industry team has had 62 successive successes in the launch business which is extraordinary in the history of space. There are also a number of C2 and space situational initiatives.

That's the laundry list. My message to you, ladies and gentlemen, and the most important message that I want to leave with you is we have a very healthy space modernization program. Having said that, and in light of this audience and in light of the fact that we are here in the annual AFA symposium, I feel compelled to add that the Air Force can be justifiably proud of its stewardship of the military space mission. And there have been criticisms on us losing the formula, there has been criticism on our acquisition systems, but let me tell you, we're doing very well in that regard. There are still challenges, and I'll be glad to address those in the Q&A.

Frankly, I don't think we tell this story well enough and take sufficient credit. I commend AFA that this is a very good news story and I think we can do better.

Let me end here and leave as much as possible time for Q&A. There are a host of other challenges and topics that I might cover, things like the acquisition workforce industrial base. There's a whole unprecedented review of space going on in this administration that has significant implications for the nation's space service, the Air Force.

So let me end with this. With that, thank you so much.

Moderator: Gentlemen, thank you very much. As you can see, I have a fistful here. Let me start with one that concerns balance. The balance and a philosophy of trying to cope with sustainment versus modernization.

Do you think we're doing a good job of explaining to Congress the tradeoffs and the costs with regard to maintaining an aging fleet versus modernizing or perhaps recapitalizing our fleet? I'll direct that to either General Hoffman or General Martin.

General Hoffman: I think they look at how active we are in modernization as a share of the budget, and it is a pretty healthy share of the budget. Unfortunately, the cost of people has gone up quite a bit, and the cost of the war on terrorism or whatever label you want to put on that has gone up quite a bit. So the amount of money available for modernization is usually the safety valve, if you will. You will pay whatever it takes to conduct current ops, and you will pay everybody's pay check. So modernization is a variable when you get into the budget, if you have a fixed

line budget. And how you operate your bases, your sustainment of your facilities and all that is another variable. Those two tend to be the bill payers.

There's not a separate category for sustainment. Part of that comes out of your operating costs, your flying hour costs per year and your working capital funds. That sometimes is a bill payer as well when you have fuel costs go way up and you have to pay that bill in that year.

So there's not a direct tradeoff between those two saying are the two in balance. I think in general they are, given the resources that we have to operate in. Everybody would like more modernization. Everybody would like more sustainment. But I think the two are as in balance as we're going to get, given the fiscal realities.

General Martin: It would seem to me that we have not, as an institution, done as well as we should have in articulating what it takes to provide to the joint team the kind of air and space and now cyber space power that will serve our entire nation to the level we think is necessary. I think that's come about probably because we were viewed from the outside as being tone deaf to the real urgent and critical needs of people in harm's way. And our public arguments dealt more about future things, but the fact is the performance of the men and women of the United States Air Force on the ground and in the air in combat was astounding and extraordinary, and really has not received the kind of credit it should have except recently in the letter that you may have seen to All Airmen from General Patraeus as a result of the evening affair and the joke that was said, he came out after talking to General Schwartz and wrote a letter to all Airmen that I found to be quite well -
- Air power was understood and well articulated by one of our sister service leaders, which I found very encouraging. I think that's a very positive step.

But in the end, to get to the basic question, I think that we risk the future of our asymmetric advantage with some of the budget cuts that we have seen recently, and on the other end, I was guilty of this as well, I don't think we have made as important the efforts at sustainment of aging equipment that we should, and those were I think related to my comments.

So I don't think we're in the balance that I would like to see us in. Again, I'm looking from outside in as opposed to being on the inside with those churns and that fight.

I think it's important for us to articulate the importance of air power, to have people from outside, like General Patraeus just did, talk about what it is that Airmen

do. Then make sure that the systems are not only sustained from a proactive perspective, but that everyone understands things like air superiority, space superiority, space surveillance, vigilance, all of those kinds of things enable all members of our armed forces and are critical to the fight.

Moderator: The next question has to do with the industrial base. For a number of years there have been some concerns with regard to, by the budget decisions on the industrial base to respond to our future needs. What challenges do you see in the recent budget decisions on our industrial base to respond to our sustainment needs and for the industrial base to respond if there's a need that we identify in terms of sustainment. I'll leave that one open for any of you who want to jump on that.

General Hoffman: I may not address the question precisely, but on my list of challenges is an industrial base question and I'm going to try to cover a lot of different areas. I believe it applies in air and space. I'm not sure I've thought through the sustainment aspect of that.

But industrial base issues have been covered by innumerable studies but we still have problems that we need to pay attention to.

First of all, we've got lots of modernization in certain areas, but there's a question of whether we have sufficient number of A Teams to do the kind of modernization that we have.

With the drawdown, and particularly with the financial circumstance in the country, in the space business we're worried a lot about second and third tier contractors. Having them survive. They are often critical. They are often the source of innovation in the space business. And we're beginning to see problems with parts, process breakdowns, that require retrofit and money.

The last thing, of course, is the aging of the space force. That may take care of itself as people work longer, but I can only recall when I was a pup we made source selection decisions often on industrial base consideration. That seems like a distant time. I don't know whether we can ever get to that point, but I think we need to raise the priority of industrial base as we make decisions.

General Martin: Just one thought. Today in the paper I saw an interesting article. It talked about a conversation that the reporter had with Senator Inouye where he said that the dual sourcing for the tanker is probably

dead this year and they put \$1.7 billion in the budget for another DDG-51 to ensure the industrial base of our maritime superiority maintained robustness, but yet no one cares about whether we have one or two engine manufacturers for fighters; no one cares whether we have one or two competing lines for fighters or one or two wide body producers, but we've got the maritime industrial base solved.

I think we need to look very carefully as a nation at what it takes to inspire the kind of design teams we need, to have the kind of competition that drives the price down, and does not put us beholden to one contractor, one labor union, one team, for the kinds of very sophisticated and very complicated systems that we're building.

So my view is the industrial base is slowly, in the air and space business, withering and potentially being destroyed.

General Moorman: The bottom line is that the industrial base will always follow the dollars. If the dollars are there, people want to make dollars and they will follow, whether it's on the commercial side or the government side.

We've actually kind of shifted the industrial base from production, and from that timeframe General Martin talked about where there's a new airplane coming out every two years or so, to the sustainment industrial base. So there's a large industrial base of how to sustain, but a lot of that sustainment is just grinding through very labor intensive activities. Take a skin off, replace it, replace internal spars. That's probably not the industrial base that's healthy for a nation. It's like keeping old steel mills going or old coal mines going. We need to get into the newer technologies -- composites and so forth. That industrial base needs to be stimulated.

In the acquisition chain, even though we give lip service to industrial base, there is nothing in the acquisition source selection process that directs you to stimulate the industrial base. We do get direction to be as competitive as possible, get the best value for the taxpayer, and meet the requirements of the warfighter. It doesn't say, and oh by the way, also stimulate the industrial base. Otherwise you might get different answers to some of these source selections that was the going-in guidance. So if you want that as source selection guidance, you've got to start your whole acquisition strategy from the very beginning with that in mind, that says you will have two radar makers in this country when you're done with this source selection, or you'll have an ejection seat company that's U.S.-based not, foreign-based, etc., etc.

I think it takes dollars to do that and it takes policy to do that. In the timeframe we find ourselves right now, both those are lacking. I think we're going to continue to go into a bathtub here, if you will, of industrial base, and that includes the intellectual industrial base. Because if you're not designing bombers, you're designing fighters, those people go somewhere else. Not that they can't be recreated, but that takes more time.

Moderator: Thank you, gentlemen.

Shift now a little bit from hardware to personnel. As our aircraft and our systems age, have our Airmen been experiencing any particular challenges with maintaining older systems much longer than any of us anticipated?

General Hoffman: Absolutely, and I talked about the great quality of the people out there but there is a monkey on their back right now called inspections. With the aging force, we find a flaw in an airplane, and there may be a fix for it -- it's a mid-life upgrade or something, but we are finding ourselves on many many aircraft going in there on some inspection cycle, whether it's inside of an engine or looking at bulkheads or looking at bolts or looking at some other part of the aircraft, that we're on an inspection cycle of 50 hours or 100 hours, and that burden is on the line troops to do that inspection.

That's one of the artifacts that gets camouflaged, if you will, because it's different colored money, it's a different part of the Air Force paying that bill, but it's squarely on the backs of our flight line maintainers.

General Martin: If I could, I'd just add one thing. General Cross and General Hobbins and I are very fortunate to be able to be senior mentors for the AFSO-21 effort and many of you may have attended some of the sessions that we've had.

One of the areas that we tend to not pay much attention to, we do a little better with our civilian force because they are paid out of operations and maintenance funds, so therefore you have a budget that you have to pay attention to. But in general, we don't pay much attention to what the number of hours of work is for us to accomplish the mission. Particularly with our uniformed members. They just work until the mission is done.

One of the areas that we're trying to push very hard with the AFSO-21 business is a sensitivity to the time that people spend at doing things. So that as General Hoffman just mentioned, if you've got to do that inspection because

you don't have a technique other than that, then for gosh sakes, let's make sure that we do everything else we can to get rid of non-value-added time for those people that are there at the flight line having to do that extra work. So that at least they can get it done in a day as opposed to dragging their days into the 18 hour category.

So I'd ask all of us to think about that. Time, which we don't pay for directly as a supervisor, is really very critical, particularly as we deal with aging forces.

Moderator: Time for one more, and it's sort of a follow-up personnel question regarding the health of not only our national laboratories but our Air Force laboratories. Are we attracting the young scientists and engineers that we need to fulfill the critical specialties in our Air Force laboratories and elsewhere?

General Hoffman: I'd say in today's economy we are. We're attracting everybody. We're even attracting people that should probably retire, we're attracting them to stay longer.

I think if the economy changed, and like I say, talent follows dollars. If the economy turns around, a lot of that talent will be pulled away. But right now with the present situation, we're attracting all the talent I think we need. It's a separate topic about civilian hiring, at least in the Air Force Materiel Command, but we're in a hiring wave that no one can recollect the magnitude of what we're hiring right now. So we're ramping up in a big way, whether it's for acquisition growth, whether it's to backfill the BRAC-directed moves where people have got to be hired in a new location, whether it's the in-sourcing that the Secretary of Defense has directed us. We are hiring at an unprecedented rate. We started in '09, and for the first time in many many years we fully consumed every dollar of civilian pay for civilian pay. Not to buy other O&M pay and stuff like that. The pace and the slope of that's going to go up even more in '10 and '11.

General Martin: I just have one comment, and the comment has to do with striking a balance. I mentioned earlier in my talk about being at war for 18 years. I think there are a lot of unintended consequences of being at war for 18 years and it's understandable that our focus is on the near term when people are dying on the battlefield.

The dilemma in the technology area is to try to not be totally focused on the 6-3, 6-4, that which matures earlier, and leaving enough for some breakthrough technologies.

Our missions, and we have always been the highest tech service, are such that we really do need a very strong AFRL to support these missions, and it's real tough to do that. But I worry a bit about it, frankly.

Moderator: Gentlemen, thank you very much for sharing your time with us and giving us some very decent insight into a very challenging issue that's facing our Air Force and our nation.

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