AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

[H.A.S.C. No. 112–15]

ARMY MODERNIZATION PROGRAMS

HEARING

BEFORE THE

SUBCOMMITTEE ON TACTICAL
AIR AND LAND FORCES

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

HEARING HELD
MARCH 9, 2011

U.S. GOVERNMENT PRINTING OFFICE

65–463 WASHINGTON : 2011

For sale by the Superintendent of Documents, U.S. Government Printing Office,
http://bookstore.gpo.gov. For more information, contact the GPO Customer Contact Center,
U.S. Government Printing Office. Phone 202–512–1800, or 866–512–1800 (toll-free). E-mail, gpo@custhelp.com.

SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

ROSCOE G. BARTLETT, Maryland, *Chairman*

FRANK A. LOBIONDO, New Jersey
JOHN C. FLEMING, M.D., Louisiana
TOM ROONEY, Florida
TODD RUSSELL PLATTS, Pennsylvania
VICKY HARTZLER, Missouri
JON RUNYAN, New Jersey
MARTHA ROBY, Alabama
WALTER B. JONES, North Carolina
W. TODD AKIN, Missouri
JOE WILSON, South Carolina
MICHAEL TURNER, Ohio
BILL SHUSTER, Pennsylvania
DOUG LAMBORN, Colorado

SILVESTRE REYES, Texas
MIKE MCINTYRE, North Carolina
JIM COOPER, Tennessee
GABRIELLE GIFFORDS, Arizona
NIKI TSONGAS, Massachusetts
LARRY KISSELL, North Carolina
MARTIN HEINRICH, New Mexico
BILL OWENS, New York
JOHN R. GARAMENDI, California
MARK S. CRITZ, Pennsylvania
KATHY CASTOR, Florida

JOHN WASON, *Professional Staff Member*
DOUG BUSH, *Professional Staff Member*
SCOTT BOUSUM, *Staff Assistant*

CONTENTS

CHRONOLOGICAL LIST OF HEARINGS

2011

Page

HEARING:

Wednesday, March 9, 2011, Army Modernization Programs 1

APPENDIX:

Wednesday, March 9, 2011 41

WEDNESDAY, MARCH 9, 2011

ARMY MODERNIZATION PROGRAMS

STATEMENTS PRESENTED BY MEMBERS OF CONGRESS

Bartlett, Hon. Roscoe G., a Representative from Maryland, Chairman, Subcommittee on Tactical Air and Land Forces 1

Reyes, Hon. Silvestre, a Representative from Texas, Ranking Member, Subcommittee on Tactical Air and Land Forces 3

WITNESSES

Chiarelli, GEN Peter W., USA, Vice Chief of Staff, U.S. Army; LTG Robert P. Lennox, USA, Deputy Chief of Staff, G–8, U.S. Army; and LTG William N. Phillips, USA, Military Deputy to the Assistant Secretary of the Army (Acquisitions, Logistics and Technology), U.S. Army 5

Gilmore, J. Michael, Operational Test and Evaluation, Office of the Secretary of Defense 22

Sullivan, Michael J., Director of Acquisition and Sourcing Management, U.S. Government Accountability Office; and William Graveline, Assistant Director, Acquisition and Sourcing Management Team, U.S. Government Accountability Office 24

APPENDIX

PREPARED STATEMENTS:

Bartlett, Hon. Roscoe G. 45

Chiarelli, GEN Peter W., joint with LTG Robert P. Lennox and LTG William N. Phillips 54

Gilmore, J. Michael 76

Sullivan, Michael J., joint with William Graveline 86

Reyes, Hon. Silvestre 48

DOCUMENTS SUBMITTED FOR THE RECORD:

[There were no Documents submitted.]

WITNESS RESPONSES TO QUESTIONS ASKED DURING THE HEARING:

Mr. Bartlett 111

Mr. Platts 111

QUESTIONS SUBMITTED BY MEMBERS POST HEARING:

Mr. Akin 119

Mr. Bartlett 115

Page

QUESTIONS SUBMITTED BY MEMBERS POST HEARING—Continued
Mr. LoBiondo 119
Mr. Rooney 119
Mr. Turner 120

ARMY MODERNIZATION PROGRAMS

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES,
Washington, DC, Wednesday, March 9, 2011.

The subcommittee met, pursuant to call, at 1:32 p.m., in room 2118, Rayburn House Office Building, Hon. Roscoe G. Bartlett (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. ROSCOE G. BARTLETT, A REPRESENTATIVE FROM MARYLAND, CHAIRMAN, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. BARTLETT. Thank you for joining us as we consider the fiscal year 2012 budget request for the Department of the Army equipment modernization programs. Today we have two panels.

Panel 1 witnesses include General Pete Chiarelli, vice chief of staff; Lieutenant General Robert Lennox, deputy chief of staff of the Army for requirements; and Lieutenant General William Phillips, military department—military deputy to the assistant secretary of the Army, acquisition, logistics, and technology.

Panel 2 witnesses include Dr. Michael Gilmore, director of operational test and evaluation, Office of the Secretary of Defense; and Mr. Michael Sullivan, Government Accountability Office, director of acquisition and sourcing; and William Graveline, Government Accountability Office.

Gentlemen, thank you for being here and thank you for your service to our country. I just returned from having led a delegation of members on a visit to Afghanistan, where we met with personnel from all of our services at several different locations. While I have always had misgivings about our involvement of Afghanistan, I want to note how I was again so highly impressed with the extraordinary courage, dedication, and sacrifice, and ability demonstrated every hour, every day by our service personnel. They are really quite remarkable.

We have always done our best to make sure our personnel have what they need to execute their missions. I have been reenergized by this most recent experience to make sure we do all we can to support the absolutely outstanding men and women serving our Nation.

In terms of this year's budget request, the Army's top two modernization priorities are the tactical network and the Ground Combat Vehicle Government programs. However, I would like to maintain that the number one modernization priority remains soldier equipment.

In saying that, I don't mean to imply that properly equipped the soldier hasn't always—properly equipping the soldier hasn't always been a priority, especially for the witnesses in front of us today, but—whom I know share that concern. There is no doubt that the equipment and body armor that our soldiers have today is saving lives. However, individual riflemen commonly carry in excess of 100 pounds of gear on an all—on all dismounted missions; some more, some less than that.

Equipment weight is a constant complaint we hear about when we talk to our deployed soldiers. Not surprising, we also see an alarming number of muscular-skeletal non-combat injuries in our military hospitals.

While we certainly support enhancing the individual soldier's capability and protection, the price we often pay is more weight. I have often wondered if we would have taken just 5 percent of what we spend on the now terminated Future Combat Systems program and applied it to lessening the weight of what are soldiers carry, where would we be today?

I know Ranking Member Reyes shares my concern, which is why we have scheduled a specific hearing on this issue next week. Somehow we must figure out how to incentivize industry and academia to lessen the weight for our soldiers without lessening the protection that that weight provides them.

In terms of the tactical network, I have always felt that one of the many mistakes that were made with the FCS [Future Combat Systems] program was that the Army should have first and foremost focused on getting the network right instead of trying to do all of the vehicles and unmanned vehicle components of the program simultaneously. We understand the importance of what the Army is trying to do with the tactical network. If we are going to send a soldier into harm's way he or she should never have to open a communications device and have it say "service not available" or "can you hear me now?"

The committee has been very critical of the lack of network strategy over the last couple of years. It is my understanding that the Army has made a lot of progress this last year in laying out a nested network strategy.

However, I am reminded of the old adage that a vision without resources is a hallucination. We need assurances that the network is based on an open architecture, isn't dependent on proprietary designs, and that it is pursued using full and open competition.

Finally, the committee has and continues to support the Army's goal of pursuing a modernized combat vehicle. However, the committee needs to understand the rationale as to why the ground combat vehicle should proceed as scheduled or if it should move to the right in time.

How do we know that the GCV [Ground Combat Vehicle] is the full spectrum vehicle the Army needs? Why did the Army not complete an analysis of alternatives before it issued the original requests for proposals, as this committee had encouraged?

Can the Army afford to launch another program that could cost up to $30 billion to procure a vehicle that carries a squad of nine instead of the current six? Why not consider as an alternative option continuing to upgrade Abrams, Bradleys, and Strykers, focus

on the network, and take part of the funds and apply it to lightening the load of the soldier?

Ten years ago we were told that the Paladin howitzer couldn't be upgraded and that Crusader and then Non-Line of Sight-Cannon, N–LOS–C, was the only solution. And now that those programs have been terminated we are pursuing an upgraded Paladin howitzer, which we were told we couldn't do earlier on, albeit with technologies from Crusader and network—and N–LOS–C. They weren't a total loss.

To be clear, I am not saying that I don't support the GCV program. And to be fair, I believe the Army requirements will become clearer to the committee once the results of the analysis of conservatives are submitted.

However, as was the case with the FCS program, it is this committee's responsibility to ask the hard questions now so that we don't learn in 5 years that the Army can't afford the GCV or that it is based on exquisite requirements.

I now yield to my good friend and ranking member, Mr. Reyes, for any remarks that he cares to make.

[The prepared statement of Mr. Bartlett can be found in the Appendix on page 45.]

STATEMENT OF HON. SILVESTRE REYES, A REPRESENTATIVE FROM TEXAS, RANKING MEMBER, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. REYES. Thank you, Mr. Chairman.

And I would also like to add my welcome. Thank you, gentlemen, for being here today, and thank you for your service.

Today's hearing on Army modernization again comes at a critical time for our Army. The Army has been at war for almost 10 years—the longest continual period of combat for the U.S. Army since the war in Vietnam and the longest war ever for an all-volunteer Army.

Like all wars, these wars have changed the Army in profound ways, and sometimes in ways that weren't predicted. The Army of today features soldiers operating from widely dispersed fixed locations and in relatively small elements, usually a company or below, instead of the constantly moving large formations that the Army practiced to fight for decades. The Army of today integrates unmanned systems, intelligence networks, biometrics, and communications networks in a very—in a way that was unforeseen before September 11th of 2001, when the term IED [Improvised Explosive Device] was not even in the Army's lexicon.

At the same time, today's Army leadership faces the same dilemma faced by their predecessors, namely answering two critical questions: First, what kind of missions must the Army prepare for to perform? And second, how to equip the Army of today while preparing for the Army of tomorrow.

Today's hearing will center on finding that critical balance and focus on the point for these two very important and pivotal questions. The fiscal year 2012 Army budget requested for modernization from my viewpoint is commendable in many different ways.

For the first time in many years the Army has a single modernization strategy that is integrated and resourced and that cov-

ers the five key aspects of equipping the force. Our chairman mentioned most of them, but they are: Soldier equipment and weapons, and I certainly share the same concerns that the chairman does in terms of the weight and finding ways to address that challenge; second, communications, intelligence, and network equipment; third, aviation and UAVs [Unmanned Aerial Vehicles]; fourth, armored combat vehicles; and fifth, wheeled combat vehicles.

A great deal of the credit for this clear and integrated approach lies with the vice chief of staff, General Chiarelli, who we are fortunate is here to testify at this hearing. While he has not yet fixed every single problem in Army modernization, his efforts and hard work have put the Army in a much stronger position to justify and protect its modernization efforts, both in the Pentagon and certainly here in Congress.

When Secretary Gates testified before our committee in February he said that because the future is so uncertain procurement funds must be focused on those areas that are useful in many possible operations, not in any narrow range. In my view, the Army's 2012 budget request does that in most areas.

It invests heavily in modernizing and expanding the Army's aviation capability and network communications. Both are areas essential to today's fight in Afghanistan and that the Army will be able to use in the future, no matter what kind of operations it conducts.

Second, significant funds are also requested for upgrades, so for soldier personal equipment that is intended to improve lethality and protection while, again, reducing the critical weight factor, another area where the Army will benefit regardless of what the future holds and what future missions develop. In this request, the Army also continues to aggressively modernize its fleet of wheeled vehicles, from MRAPs [Mine Resistant Ambush Protected Vehicles], to trucks, to Humvees.

And finally, in terms of armored vehicles the request makes what were probably the most difficult judgment calls. The request clearly focuses on the future, with heavy investment in the ground combat vehicle program. In order to achieve this focus on the future, however, the request does show a significant drop across the board in ongoing upgrades for current vehicles.

In three major cases—the Abrams tanks, the Bradley fighting vehicles, and Stryker vehicles—the Army has chosen to accept the risk of production shutdowns in the 2013 to 2016 timeframe as the Army waits to produce upgraded versions of these vehicles at the end of this decade. These shutdowns will present significant challenges to the Army and the defense industrial base, so I look forward to hearing more today about how the Army will mitigate the risk involved with this plan.

However, despite this and other challenges, the Army modernization budget request for 2012 represents a solid plan for the future that seeks to balance the needs of today with the potential needs of tomorrow. While the subcommittee will carefully review this plan, I think the Army is starting from a position of strength, in large part due to the hard work over the past year from the three gentlemen that are sitting at our witness table.

So today, Mr. Chairman, I look forward, as you do, to hear more about the details that will significantly impact the Army in 2012 and beyond. Thank you, Mr. Chairman.

[The prepared statement of Mr. Reyes can be found in the Appendix on page 48.]

Mr. BARTLETT. Thank you, Mr. Reyes.

Without objection, all witness statements will be made a part of the hearing record.

General Chiarelli, we do not normally have the benefit of hearing from the vice chief of staff at our yearly subcommittee modernization hearing, so we really appreciate you taking the time to help us understand the Army's modernization priorities. Clearly, among your many responsibilities Army equipment modernization is an issue of great importance to you and the Army or you wouldn't be here today, sir. Thank you very much.

I understand, General, that you have the oral testimony representing all three of you. Is that correct?

General CHIARELLI. I do, Mr. Chairman.

Mr. BARTLETT. Okay. Thank you. Please proceed with your opening remarks.

STATEMENT OF GEN PETER W. CHIARELLI, USA, VICE CHIEF OF STAFF, U.S. ARMY

General CHIARELLI. Chairman Bartlett, Ranking Member Reyes, distinguished members of the subcommittee, I thank you for the opportunity to appear before you today to discuss the fiscal year 2012 budget request as it pertains to Army acquisition and modernization. I am joined by my colleagues, Lieutenant General Bob Lennox, deputy chief of staff of the Army, G8; and Lieutenant General Bill Phillips, principal military deputy to the assistant secretary of the Army for acquisition, logistics, and technology. We look forward to answering your questions at the conclusion of these opening remarks.

As you are all aware, our Nation's military continues to face a broad array of complex challenges as we approach the start of the second decade of a long-term struggle against a global extremist network. Today's uncertain and dynamic strategic and operational environments, coupled with current political and fiscal realities and the rapid pace of technological development have made our outdated, Cold War-era strategies no longer supportable.

To be successful now and into the future we require a strategy that takes a more focused and affordable approach to equipping our force. Our evolved strategy, aligned with the Army Force Generation model, ARFORGEN, will allow us to incorporate lessons learned, improve or maintain core capabilities, incrementally modernize to deliver new and improved capabilities, and integrate portfolios to align our equipment modernization communities, thereby enabling us to develop and field a versatile and affordable mix of equipment, ensuring our soldiers and units have the resources and capabilities they need to be successful across the full range of military operations today and into the future.

As part of the Army Modernization Plan 2012 we have prioritized our material programs to focus on capabilities which give our units and our soldiers a decisive edge in full-spectrum op-

erations. While considering program cost and size, the emphasis is on capabilities critical to Army success and our ability to network the force, deter hybrid threats, and defeat hybrid threats, and protect and empower soldiers.

I have talked about the importance of the network with members of the subcommittee on numerous occasions. I believe it represents the centerpiece of the Army's modernization program, and today I am pleased to report we are making significant progress.

The Army is past talking concepts. We are making the network happen, delivering needed capability downrange as we speak. Certainly there is much more work to be done, but I am confident we are headed in the right direction.

Much of what we are trying to accomplish in terms of improving the pace of Army acquisition derived from what we learned about the network and about the nature of rapidly evolving technologies. However, the principles have application across the entire modernization program.

I am prepared to discuss in greater detail the specifics of the Army's critical fiscal year 2012 priority programs, as outlined in my statement, for the record and during questions and answers.

The advanced technologies added capabilities we are pursuing are vital to the success of our force. That said, we recognize that modernizing the force is not solely about buying new or better equipment. It also has to do with spending money wisely and finding efficiencies wherever possible.

I assure the members of this subcommittee, I and the Army's other senior leaders remain diligent in our efforts to be good stewards of scarce taxpayer dollars. Over the past year our ongoing capability portfolio review process—we have identified a number of areas we are able to make changes and eliminate redundancies or outdated requirements.

In fact, as part of the Department of Defense's reform agenda the Army has proposed $29 billion in savings over the next 5 years, and we will not stop. We will continue to pursue further efficiencies in the days ahead.

In the meantime, I respectfully request your support of the Army's proposed research, development, and acquisition budget of $31.8 billion for fiscal year 2012. We believe this request allocates resources appropriately between fielding advanced technologies in support of soldiers currently in the fight and the development of technologies for the future.

Mr. Chairman, members of the subcommittee, I thank you again for your continued, generous support and demonstrated commitment to the outstanding men and women of the United States Army and their families. We—all three of us—look forward to your questions.

[The joint prepared statement of General Chiarelli, General Phillips, and General Lennox can be found in the Appendix on page 54.]

Mr. BARTLETT. Thank you very much. And thank you for your—collectively—many years of service to our country.

As is my custom, I will ask my questions last hoping that they will all have been asked so that I won't need to ask any, and I now turn to my ranking member for his questions.

Mr. REYES. Chances are, probably not, Mr. Chairman.

My first question deals with the Army's number one priority vehicle, which is the ground combat vehicle. So far, the Army has justified the need for the GCV by pointing at the need for better protection, more onboard power, and the ability to carry additional soldiers. However, there are those that have argued that an upgraded Bradley vehicle would be adequate to meet the Army's needs.

So my questions are: What specific new threats, especially in terms of IEDs and anti-tank missiles, is the Army worried about in the 2020 timeframe, when the GCV would be available in large numbers?

Second, what about an upgraded Bradley? Would that not be adequate to meet these future threats?

And third, what about using lasers and other directed energy weapons in the future? How does a GCV compare in relation to upgrading Bradley vehicles in this very important regard?

So, I will leave it open, General, for whoever wants to tackle those.

General CHIARELLI. I will just make a few comments, sir. First of all, the Bradley is going to be around for a long time. The GCV is a fighting vehicle and it is a full-spectrum vehicle.

We believe we have revisited our first RFP [Request for Proposal], put out a second RFP, where we carefully went over every single one of the requirements, and we have worked very, very hard to ensure that it is a full-spectrum vehicle. This is a vehicle that can be used across the spectrum.

And one of the things it does is offers capability packages. Those capability packages would give it an opportunity to work in environments such as Afghanistan, and in different parts of Afghanistan and Iraq where there are different threats. And with the addition of those capability packages, mostly in passive armor, the vehicle gets heavier or lighter when you take them off.

In addition to that, we are going to finally get the entire squad, although the Bradley, as pointed out, takes less than the squad—finally in the GCV we will be able to put the entire infantry fighting squad. In addition to that, we will be able to provide an interpreter and a medic a place to be, which are critical on today's battlefield.

We are working very, very hard to get it out in a 7-year period because we believe we need the size, weight, and power to power the network in an infantry fighting vehicle.

But I will let Bill and Bob make further comments, but I just want to say the Bradley is going to be around for a long time.

Gentlemen.

General PHILLIPS. Sir, I would just only add one thing. When you see the analysis of alternatives that will come forward, part of the Bradley—the second question that you had, the Bradley piece of that—will be considered as a part of the GCV program, so you will see that coming forward.

The other piece that I would want to emphasize for GCV that General Chiarelli sort of alluded to is, we took the original RFP on the 25th of August of last year and we decided to pull it back. When we went through and recharacterized all the requirements—there were over 900—we determined that the big four that General

Chiarelli just described, we came up with about 130 that were critical to make sure that we met the big four capability inside the GCV, and the others were tradable in some kind of way. That is going to allow us to get this vehicle in 7 years at an affordable cost.

The other point that I would emphasize is the incremental capability with the GCV itself. We will build a vehicle in 7 years and then we want to be able to upgrade that vehicle over time.

General CHIARELLI. If I could just add one other thing: What is amazing if you look back at Army vehicle modernization is the story of the M1 tank. Now, we are not building a tank, but what we would like to do is have a program like the Abrams.

Think about it. The Abrams, 1978 technology that has been upgraded from 105-mm gun to 120-mm gun, from a commander's weapon station that—I remember we—not all of us had a rough time operating—to one today that makes each Abrams tank worth two Abrams tanks. That is because that vehicle was built with size, weight, and power built into it to allow it, over time, to have incremental builds.

That is what we want to do with GCV. We want a vehicle that looks much different 10 years from now than 7 years from now, when it first comes out, because we are able, through incremental builds, to put new technologies on that vehicle as they become proven and capable.

Mr. REYES. Thank you very much for that additional information, which brings me to a second concern, and that is that the budget proposal for 2012 shows production breaks for the Abrams tank, Bradley fighting vehicle, and Stryker vehicles, starting in 2013, that could last—projected from 3 to 5 years. The 5-year plan then shows production of upgrades starting back up in 2016 or later.

So the questions that I have are: How will defense industry maintain these production lines during the period—the shutdown years? How can the Army be sure that those production lines will still be there after they have been mothballed for several years?

And what is the economic impact going to be? What will the Army do to keep the workers employed at those companies? Because obviously a concern that I and other members have is that the skilled workforce would just move elsewhere and would not be available again when this—when these production lines are called upon.

General LENNOX. Congressman Reyes, great question and great concern, and not one that we didn't consider this year. As General Chiarelli led us through our portfolio review of the entire combat vehicle fleet—we took a very holistic review this year, and our fiscal year 2012 proposal calls for about $2.5 billion. It tries to balance transforming our combat vehicle fleet with investments in the ground combat vehicle, improving the Bradley and the Abrams for the future, and replacing the aging M113 [armored personnel carrier] fleet.

So we are trying to accomplish all three of those things in a very, you know, fiscally informed approach in our strategy, and we have undertaken to do that. So there are going to be shutdowns. In the Abrams line, for example, we are going to finish and buy our acquisition limit of those vehicles.

We are buying the very finest M1s right now, the SEP [System Enhancement Program] version. We have got a very good strategy that addresses both the Active and the Reserve component. So we have taken a good, thoughtful approach to that, but there is some risk.

In the area of the Bradley, we also have a two-vehicle type fleet approach. We have looked at both the Active and the Reserve component. They will both receive modernized, pure fleet versions of the Bradley. And we have again bought our limit of that vehicle.

The Stryker vehicle has proven itself in combat. With this committee's help and Congress' help we have introduced a double-V hull approach to the Stryker vehicle. We are going to have one brigade that we are going to send to combat this summer and we will assess it.

And in the fiscal year 2012 approach we have also invested in modernization programs for all three of those vehicle types. They will not prevent, however, the production break that you talked about. We are cognizant of that.

And I think I will turn it over to General Phillips, who can talk about some of our approach to that, if that is okay.

General PHILLIPS. Sir, I would just say that we share the concern with the industrial base. And the industrial base across all the portfolios is incredibly important to us.

It is also important that we have worked very closely with industry, and I will just give one example: the Humvee, and with AM General and the Humvee production line. Most recently we worked with Charlie Hall, the new president for AM General, and with the team there, to work on the production capability—number of vehicles per day. And most recently we were able to downsize slightly, from 55 per day to 35 per day, which sustains the industrial base over a longer period of time. And with FMS [Foreign Military Sales] customers and others coming in we are able to sustain that critical capability for that production line for a period of time longer.

But we must do so in the most efficient, effective manner as we consider all options, sir.

Mr. REYES. Thank you.

Thank you, Mr. Chairman.

Mr. BARTLETT. Thank you.

As you heard, bells have gone off. I think we have time for Mr. LoBiondo's questions. Then it will be about 5 minutes before the end of the vote, and we will need to recess for three votes, I think. We will be back as soon as we can get here.

Mr. LOBIONDO. Thank you, Mr. Chairman.

My question is regarding the modernization of the Abrams tank, and in recent weeks we have heard from the Secretary of Defense and I believe from you, General, the need to modernize the tank into the future. Specifically, the Army's budget looks like it has less than $10 million in the fiscal year 2012 budget, and I think the statement was the tank has virtually reached its upper limits for space, weight, and power.

So it looks like it is about $100 million reduction from previous budgets. In light of this, does the Army still support the Abrams modernization?

General LENNOX. Congressman LoBiondo, you are right. The fiscal year 2012 submission does call for about $10 million in RDT&E [Research, Development, Test, and Evaluation] for the Abrams tank.

We have several—hundreds-of-millions-of-dollars underexecuted from previous years, so now that we think we have the strategy right and the requirements right, the combination of previous years' unexecuted funds and this amount we think is about the right amount that we can execute in fiscal year 2012, and that was the rationale for our approach. In the out-years we have programmed additional amounts for the Abrams.

General CHIARELLI. And I might add, our modernization activities are focused on increasing the SWAP [Size, Weight, and Power] capability of that tank, particularly the power portion of it. So that is exactly our focus with the Abrams.

Mr. LOBIONDO. And as a follow-up question, the modernization of the Abrams engine—I understand there is a proposal that could increase fuel efficiency by up to as much as 17 percent, which could translate to about 50 gallons a day for one Abrams tank alone. And with the emphasis on energy efficiency and who knows where oil is going to go to per barrel, the fuel consumption could be dramatically improved.

In light of the Army's energy conservation goals does the Army believe the Abrams modernization program should also include fuel-efficient engines?

General LENNOX. Congressman, it does, absolutely, and that is one of the alternatives for Abrams modernization. We have not yet defined what that will be but that will certainly be one of the considerations.

Mr. LOBIONDO. Would seem that, in light of the energy costs and rising, skyrocketing, it might be something that could be moved a little closer to the front burner.

Okay. Thank you, Mr. Chairman.

Thank you, Generals.

Mr. BARTLETT. Thank you so much.

We have 8 minutes remaining. We probably can take one more question. And who is next in our——

Ms. Tsongas.

Ms. TSONGAS. Thank you.

And thank you all for being here, and nice to see you again.

I would like to sort of revisit the body armor question. I know that we will be having a hearing in the future, but nevertheless, you have heard the concerns expressed from Chairman Bartlett, from Ranking Member Reyes, and so I would just like to revisit it.

To sort of restate the concern we have—and you know it well—currently soldiers deployed in Iraq and Afghanistan are outfitted with armor that weighs as much as 40 pounds. And, when combined with the gear that troops must carry in the field, the total weight our soldiers carry can exceed 120 pounds, causing skeletal injury just through the mere fact of carrying these materials.

But also it poses another challenge. At an Armed Services Committee hearing just several years ago, when I was newly arrived in Congress, I asked a sergeant who was testifying about his experiences using body armor in Iraq if there was a temptation to take

off the armor, given its weight and restrictions on mobility, and he replied that, "Yes, ma'am. There is a risk that all soldiers are willing to take. And I think that in certain situations, mission dependent, that as soldiers we would be happy to take off some of the body armor to be more mission-capable, more mobile on the ground, more flexible faster."

The President signed into law language in the Fiscal Year 2011 National Defense Authorization Act to establish separate, dedicated budget line items for body armor to improve research, development, and procurement of body armor equipment. This was a positive step in ensuring that the Department of Defense focused on addressing weight and protection issues and that Congress provides the necessary oversight.

So my question is for you, General Chiarelli. Why has the department's fiscal year 2012 budget request failed to include this procurement line item, created by this very committee last year, providing armor research and development, and failed to conform to the statutory requirement in fiscal year 2011?

General CHIARELLI. Well, since I appeared before the committee last time on lighten the load we have made significant progress, and one area is in body armor. I think you know that we went ahead and gave soldiers the option between the old IOTV [Improved Outer Tactical Vest] carrier and a new, lightweight plate carrier, which is 8 pounds lighter than the IOTV. That is a significant improvement over the weight we had before.

I was recently at a Yuma, where I saw a new 16-mm mortar tripod and 16-mm mortar that is 8.7 pounds lighter, and a new 81-mm mortar that is 20 pounds lighter than its predecessor. At the same time, cold and wet weather gear has been improved and is not only better but is lighter and less bulky.

We continue to look at ways to further lighten body armor, but I have not heard of any technologies now that will give us the required protection as—and the capabilities continue to increase at a lighter weight.

Bill, has—anything you have heard of?

General PHILLIPS. No, sir. I would only add a couple points, sir, on target.

Ma'am, our body armor is the most tested in the world, and for the targets for which it is designed to defeat there has never been a body armor that has been defeated by that kind of weapon. We saw that last year—by that kind of a round.

We listened to your comments last year. We created a line this year, or in fiscal year 2012, for RDT&E, and for that year and some of the out-years as well we programmed about $5.8 million of RDT&E into the body armor line.

At the same time, we are currently looking at a requirement for body armor holistically that is coming forward to the Army staff and we expect to see that requirement through the Army and approved probably in the fourth quarter of this year. And we will continue to work body armor really hard.

Couple other things that I would share on lightening the load is things as simple as shoes and boots. The boots that have been worn previously in Afghanistan—we are using a new Danner boot that reduces the weight per soldier of about 1.2 pounds.

So we are looking, in every way possible, for the ability to lighten the load on soldiers.

Ms. TSONGAS. Well, I think the point of a separate line item was really—there is no quick answer, and obviously without a focused investment in it we will never develop an answer. And so these sound like positive steps forward but there is still much work to be done. Eight pounds is obviously a good thing, but the load is still altogether too heavy, and it is going to take a very focused investment in research and development, and I encourage you to engage in that.

Thank you.

Mr. BARTLETT. Thank you very much.

We need now to recess for the three votes——

[Recess.]

Mr. BARTLETT. Thank you for your patience.

Okay, Mr. Kissell. Thank you.

Mr. KISSELL. Thank you, Mr. Chairman.

And I would also like to thank you for your patience and thank you for the job you all do.

I have three worries—not questions, but worries. And you have addressed them and I just want to kind of address them again.

Number one, I worry about the troop strength as we—I know we are talking about 2014, but the concerns about—we get the troops we need to keep the rotations we need to stay home 2 years for a year in combat, and I am concerned we drop off and then 6 months later we need those troops.

I am concerned about the fragmentation of what we need for today's combat in terms of equipment versus planning for the future. Do we have enough of a plan that we don't end up with a mismatch of a lot of different kind of things and kind of 3 years from now we say, "Gee, how did we end up with this?"

And I worry about the training of the soldiers and types of warfare other than what we are doing now, so that—I talked to people from the 82nd and they—you know, "When is the last time you jumped out of an airplane?"

"It has been a while because that is not what we are doing now."

And I could throw in the National Guard and Reserve but I said three. So, you know, I am just curious as to some of your thoughts on these three areas.

General CHIARELLI. Well, sir, that is why I think GCV is so absolutely important. It is a full-spectrum vehicle. You know, and we talk a lot about the light force, but every single unit that we send into theater today comes out on the other end when they get assigned their TPE, or theater provided equipment, looking like a heavy force.

We end up putting five light infantrymen into a vehicle that weighs over 20 tons. That squad is running around the battlefield today going from point A to point B in 40 tons of equipment.

And that is what GCV does for us. We see GCV as a vehicle for the future and for today, quite frankly—a vehicle that will add, through these capability packages, additional passive armor and composite form when it needs it, if it gets into direct firefight, with the ability to shed it when it is not needed and it needs protection only from underneath from an IED fight; a vehicle that can go into

Sadr City, where we saw a lot of explosive formed penetrators being used in Iraq with the appropriate protection on it, to when you used it out in the West where you never saw an EFP [Explosively Formed Penetrator] not having to carry that extra weight.

So GCV is really our attempt here to try to do something that takes into account all the lessons we have learned over the last decade and ensure we have a combat vehicle that will allow us to fight in a full-spectrum environment.

General LENNOX. If I could, Congressman, over the last year General Chiarelli took us through a series of portfolio reviews, and you have heard the Secretary of Defense say we don't do very well at predicting the future. As an output of those portfolio reviews we try to develop strategies that emphasize versatility and adaptability.

General Chiarelli just talked about one of them, the ground combat vehicle—very critical and important to us. The network is another one. We think if we can get the network right it will work in—across the range of military operations and empower soldiers in that regard.

Our aviation and our ISR [Intelligence, Surveillance & Reconnaissance] portfolios kind of add versatility to the kinds of missions we could be doing, be it along the border or in Afghanistan today, or some other mission in the future. And finally the soldier—I think Congressman Reyes went down the list earlier of the different kinds of attributes that you want to cover down in your portfolios, and empowering the soldier for the future to give them the right mix of protection and lethality are critical.

And I think we have done that over the course of the last year. I am sure we haven't gotten it right—perfectly right—but I think we have done a pretty good job at having that kind of versatility and adaptability built in.

General CHIARELLI. And what is going to be different this time is we are not going to go another 10 years and not do this. We are internalizing this into the Army process so that we are reviewing this all the time.

I was just down and saw the Third Brigade of the 82nd Airborne on Thursday using a rifleman radio with some of the command and control software that we are providing, and I tell you, it just made me feel so good to hear those soldiers talk about a capability that we had put in their hands as part of the JTRS [Joint Tactical Radio System] family, the rifleman radio, and say, this fills a capability gap that they have had for the longest period of time.

They were just ecstatic about this radio and how it works. And it is really not a radio; it is all I.P. [Internet Protocol]-based, but the ability to pass data and have voice communication with all the members of that squad using a nonproprietary waveform, SRW [Soldier Radio Waveform], that works and passes that data, and to hear those soldiers was just absolutely wonderful.

Mr. KISSELL. Well, I think that is one of the keys, and I know it is something we wrote into the last defense authorization, is to get feedback on new systems from the guys on the ground. And I think that is so important.

And one of the points that was made, we have just—we have got to do this constantly. It has just got to be a measure in where we

are and just a constant, you know—keeping an eye on it. And I know this is what we are going to do, but it is just—once again, it is a worry and I appreciate your time.

And I yield back, Mr. Chairman.

Mr. BARTLETT. Thank you.

Mr. Platts.

Mr. PLATTS. Thank you, Mr. Chairman.

First, certainly my heartfelt thanks to all three of you for your dedicated and courageous service to our Nation. On Friday this past week and Monday of this week I had the somber responsibility to be at West Point for the burial of a true American hero, First Lieutenant Daren Hidalgo, and a young man who I had the privilege to nominate to West Point and gave his life February 20th in Afghanistan, and certainly a reminder of the importance of the issues we are talking about here today and the sacrifices that these courageous men and women in uniform are making in harm's way on behalf of all of us. So I sincerely appreciate what you and all in uniform are doing for us, and your families.

I want to touch on, and I apologize coming in late from another hearing, and I am running—I have the Secretary of Education in my Ed Committee hearing I have got to run to next—if I repeat anything that was asked earlier. And I want to touch on mainly Bradleys and M88s [armored recovery vehicles]. And it is my understanding that in the 2012 track vehicle budget that there is about $250 million for upgrading Bradleys, and that is something that you believe, as a service branch, is critically important to—not just having Bradleys out there but have them modernized to the best of our abilities for the needs of the soldiers in the field. Is that an accurate statement?

General LENNOX. Yes, sir, it is. Two hundred fifty million dollars allows us to pure fleet both the Active and the Reserve, with certain types of Bradleys—most modern types of Bradleys. And it caps off our Bradley investment.

Mr. PLATTS. A follow-up, then, specifically with Bradleys in Guard—and we have our Pennsylvanian Guard, also Stryker brigade, but interact with my Guard a fair amount here at home and overseas: Is also accurate that in the 2010 funds that were looking to upgrade the Army Guard's heavy brigade combat team to the Desert Storm operation, is that accurate?

General LENNOX. Congressman, I can't tell you which set of funds—which year we are doing it. I know it is in the plan that takes care of the brigade in Pennsylvania and the other separate battalions that are in the National Guard. They will all be upgraded to that version.

Mr. PLATTS. Is there—and you may not be able to answer this today—is there a timeframe for when the Guard units will start receiving the upgraded Bradleys?

General LENNOX. I will have to take that one for the record, Congressman. I know it is in our plan and it is in the next several years, but I can't tell you specifically when they will see them.

[The information referred to can be found in the Appendix on page 111.]

Mr. PLATTS. Appreciate your following up with me and the committee.

And then on the M88s, the A1 and the A2 versions, is there plans at all to upgrade to the A2 version and—across the fleet, or, you know, all of them or just a partial upgrade?

General LENNOX. Congressman, it is really going to depend for us on how the ground combat vehicle develops. It will inform us whether or not we have an adequate mix of the A1 versions and the A2s, which we have today. We think we have a pretty good balance, but as we see the ground combat vehicle and improvements that may add weight to our combat vehicles in the future we are going to have to make that decision in the out-years.

Mr. PLATTS. Whether to maintain a mix or—okay.

A final—more of a comment, is associate myself with colleagues before we broke who were addressing the issue of personal body armor and the importance of doing right in this category.

And this really, General Chiarelli, in my first time to have the privilege of interacting with you was in Iraq, and I will always remember you had a set of body armor there, including the glasses with the piece of shrapnel in one of the ballistic sunglasses, and that image, or that demonstration that you gave us stayed with me, on the importance of making sure we do right by our men and women in uniform in their own personal protection in addition to equipment modernization of the type we are talking about here today, and just associate myself with the importance of us not letting up on that effort as well.

So my thanks, again, to each of you for your service and your testimony here today.

I yield back, Mr. Chairman.

Mr. BARTLETT. Thank you.

Mr. Critz.

Mr. CRITZ. Thank you, Mr. Chairman.

Just two quick questions, and one I am going to show some ignorance because it was an article I read and I am trying to catch up, but I understand that the Army is going to—you are slowly eliminating the Sherpa airplane from Army aviation, and if I understand correctly—was it a C–27 [Alenia Spartan military transport aircraft] that was going to replace it and now the Army has decided that there is not going to be any more Army aviators, that you are going to rely on the Air Force to supply the C–27?

And I come from a state that has lots of National Guard, a lot of aviators that wear the green of the Army, and it has been a concern and I am just curious as to what the justification or—is this a budgetary issue or is this something that you see that there is not a need for it?

General CHIARELLI. The C–27 is the replacement, and we—our predecessors appeared before this committee and talked about the need for an improvement for the Sherpa, a replacement for the Sherpa, and the C–27 was always to be that replacement. There will be aviators in the Army.

But we find it necessary, as we went through the portfolio on aviation, to go with earlier plans, and that was as the C–27 comes onboard to, in fact, divest ourselves of the Sherpa over the next 4 years. Because it is not pressurized; it is an older aircraft. And we have got to look to the Air Force to provide that mission set for us using the C–27, which is, of course, a much more capable aircraft.

Mr. CRITZ. Right. Right.

So the C–27, though—there are still going to be Army aviators flying C–27s, or that has been eliminated? The Sherpa is eliminated along with the mission for the Army?

General CHIARELLI. The mission remains, but it will be—we will be supported by the United States Air Force and the C–27. The specific pilots who are currently Sherpa pilots will be given an opportunity, like pilots do many times, to transition to other aircraft that remain in the Army inventory.

Mr. CRITZ. Okay. Thanks.

And one quick question, and, General Phillips, you actually answered an inquiry I had on the APU [Auxiliary Power Unit] for the Abrams, and I am going to follow up with that as well, because it seems that during Operation Iraqi Freedom we had long fuel lines, fuel tails to supply, and it was more of an issue. And it seems like we do this—we do it in the private sector as well so that when it is needed everyone is saying, "Okay, let's study the APU," and then you get to a point where now it is not such an issue and it tails off again.

And I believe we are at about 20 years now we have been studying the APU, and I am just curious, are we ever going to see one in an Abrams in my lifetime?

General PHILLIPS. Congressman, great question. As we look at the Abrams and really all of our systems it is important that we take a holistic look on all the systems that are in there surrounding space, weight, and power. And certainly the APU that is inside the Abrams is a key part of that strategy.

And also fuel efficiency, as we look at fighting in places like Afghanistan and potentially other places around the world. How can we gain more fuel efficiency inside those platforms?

As we look at ground combat vehicle that has been discussed at length, there is a fuel efficiency requirement that is in that system as well. JLTV—joint light tactical vehicle—also has a fuel efficiency requirement as well.

So we are very serious about the systems and subsystems inside our platforms as we look at modernization for Stryker, Abrams, Bradley in terms of efficiency, and greater capability as well, sir.

Mr. CRITZ. So I am not sure if I heard—so where is the APU inside the Abrams? Five years? Next year?

General LENNOX. Well, what we have funded, Congressman, is the start of the Abrams modernization program. So in fiscal year 2012 we start with our requirement. As a result of our holistic combat vehicle fleet we have decided that we do need to upgrade the Abrams with all those concerns, and the APU will be one of these areas.

Engine, APU, space, weight, and power issues inside the Abrams will all be taken as part of that. And it will be over the next 3 or 4 years before that will get finally settled out. It is in our funding in our program but it is not in the immediate future—not in the next year or so.

General CHIARELLI. As a tanker I will tell you—I hate to correct you, sir, but it has been longer than 20 years. We have been looking for an APU that does everything we thought an APU would do,

but it has been a—one of the most difficult engineering challenges I think we have had.

Mr. CRITZ. Well, thank you.

Thank you, Mr. Chairman. I yield back.

Mr. BARTLETT. Thank you.

Ms. Hartzler.

Mrs. HARTZLER. Thank you, Mr. Chairman.

And thank you, Gentlemen. It is an honor to be here and to hear from you.

I was impressed with reading all of the procurement items that we have and glad to see that we have got some new Black Hawks—47 new Black Hawks, 32 new Chinooks, and 19 remanufactured Apaches. Whiteman Air Force Base—of course we have Apaches and we are very excited about that.

I did have a couple questions. Under—on page five—well, you don't have that—but it says that under the family of medium heavy tactical vehicles that the budget—2012 budget requests $433 million for a total of 2,290 trucks and trailers. I just wondered, does that mean total then or does that mean how many more we are going to buy this year?

General LENNOX. Ma'am, that does mean the additional amount in fiscal year 2012, and our goal is to replace the aging 2.5-ton, 5-ton 800 series and 900 series family of medium tactical vehicles, so we will do this over time and that is the fiscal year 2012—you have it exactly right—amount.

Mrs. HARTZLER. Okay. Very good. And that would be the same for the heavy truck, the 7,928—that will be new—new trucks in that category, right?

General LENNOX. Yes, ma'am.

Mrs. HARTZLER. Okay. And there was some press articles a couple of years ago, General, that—especially the "Baltimore Sun"—regarding the weight reduction initiatives for soldiers, and saying that during that time there was over 20,000 soldiers were in non-deployable status due to muscle or bone injuries attributed to carrying the heavy rucksacks over rough terrain. So I was wondering what improvements have been made to lighten the load of our soldiers in 2009?

General CHIARELLI. I appeared before this committee last year to talk about our lighten-the-load efforts, and I am here to say that we have made significant progress. I just saw the other day at Yuma Proving Grounds a brand new 16-mm mortar that has been reduced 8.7 pounds and a brand new 81-mm mortar that has been reduced 20 pounds using composite.

We have provided a second type of body armor, what we call a plate carrier, to our soldiers, which lowers the weight 8 pounds. We have fielded a brand new machine gun that is 8 pounds lighter—MK 48. It is an M240 light machine gun that has gotten rave reviews from soldiers.

We are working with lighter boots, new cold weather and wet weather equipment that not only protects better but is lighter. We have a full court press on lightening the load of soldiers, and we will continue to work that.

Mrs. HARTZLER. I was at Fort Leonard Wood about a month ago and the soldiers were raving about their new boots and the shoes

that they have and how they say they are just as good as Nikes or anything; they would rather go running in those than regular type of tennis shoes. And I am—as a former track coach I thought that is smart. That makes sense to have them like that.

So what is the, just, total weight that a soldier carries, then, if you have the body armor on and the sack—what are we looking at in their——

General CHIARELLI. It depends on the mission. Not every soldier will carry an 81-mm mortar, but for the one who does get caught with the base plate of the mortar, to have a 20-pound savings in the weight is a heck of a lot, which allows that soldier to either carry something else—additional ammunition—or to lighten that load.

But I think our studies show anywhere from about 50 pounds to some, prior to us beginning this initiative, went up to 110 or 120 pounds, depending on exactly what it is they were carrying.

Mrs. HARTZLER. That is amazing. I am going to be going to Afghanistan soon and I hope to be able to put on all of that and see what it feels like. I am a farm girl, and we would pick up a bale of hay and it would weigh about like that and that would be hard to carry that around all day.

And so I appreciate your efforts to try to make it more streamlined and lighter, but yet keep the safety factor. So I applaud what you are doing. Thank you.

I yield back, Mr. Chairman.

Mr. BARTLETT. Thank you very much.

I have a couple of quick questions and then I will ask one for the record, and there may be others submitted for the record as well.

General Chiarelli, with regard to force structure and in terms of equipping the force, what I would like to understand is the relationship between the current requirement for 45 Active Duty brigade combat teams and the—cut the end strength of 27,000 between 2015 and 2016. General Casey testified last week that it took 10 years to get where we are today in terms of dwell time and equipment.

How do you plan program and budget for equipment with a pending end strength cut of 27,000 soldiers when it is condition-based? Are there plans to reduce the current requirement of 45 Active Duty BCTs [Brigade Combat Teams] and/or to change the current mix of heavy infantry or Stryker brigades?

General CHIARELLI. Well, as General Casey testified, this is conditions-based. It is based on that we are out of Iraq. In most numbers it is based on the drawdown in Afghanistan progressing from this summer through 2014. And it is based on no other requirement for a large number of land forces in any other contingency.

I would add a fourth condition, and that is access to the Reserve component. We have got to have access to the Reserve components.

We don't know whether that is going to be brigade combat strength that is going to come out. We are going through the mission analysis right now to look at the 27,000.

But understanding the modernization program that we have brought onboard and how we have done that with our capability portfolio reviews, we are looking at 2-year packages. And with a third of the force always in reset we really believe we can do this.

And it is absolutely essential we do this, given the top-line cut that we had, so that we can ensure that we do not rob our equipment accounts to get underneath the cut that we received in the top line.

So we feel that by having the time to plan for this across the board, both in equipment and exactly where we take those cuts, and given those four conditions, that it makes a lot of sense for us to be looking at this now. But General Casey also does call it reversible planning, that based on the situation we could, in fact, reverse and feel we would get the support of the Secretary of Defense if conditions changed.

Mr. BARTLETT. Thank you.

And the second question, as I mentioned in my opening statement, the Army continues to review its network strategy to ensure that the Army's acquisition strategy supports the needs of the warfighters and the fielding of the brigade combat team tactical network. Would you please detail the essence of your evolving acquisition strategy, the timelines, and how you are proposing to align these with the Army's needs in Afghanistan and the BCT modernization schedule?

In particular, please explain how your network strategy will impact the Joint Tactical Radio System program. And you might, if you wish, submit additional details for the record after your response to this question. Thank you.

General LENNOX. Congressman Bartlett, great question. For us it is really two key programs in fiscal year 2012 get us along the big first step of building capacity in our network, and that is the WIN–T [Warfighter Information Network–Tactical] program, where we have about $1.3 billion requested, and that is the big pipes that get us from satellites down to corps, division, brigade, and battalion, and even to the company level that start providing the big pipes and capacity down to soldiers.

The next is the Joint Tactical Radio System, and we have requested about $800 million for a variety of radios that take the communications then from the brigade and battalion level down through the company and platoon to the individual soldiers. You heard General Chiarelli talk about the rifleman's radio. That is part of our Joint Tactical Radio System.

We think the program has made enormous progress and we think it is on the verge of really providing the capacity that we need for soldiers in the future.

General CHIARELLI. Key to our strategy is what we are doing out of Fort Bliss, Texas. The establishment of a full brigade combat team—we call it the AETF [Army Evaluation Task Force]—that has all the equipment in the Army, from that which the light soldier has to that which the heavy soldier has, and putting them on a 4-month test schedule. We are going to solve a lot of problems out here.

I know everybody looks at JUONS [Joint Urgent Operational Needs Statement] and ONS [Operational Needs Statement] and getting support to the warfighter because he needs it, but many times because we don't have anybody dedicated to being able to do this like we have now that equipment is sent downrange without giving soldiers the opportunity to get through the integration issues, and those integration issues have to be done downrange.

By putting this brigade into a 4-month test cycle they are going to be testing every single 4 months. We are going to be able to rapidly take even the requests from the fields in ONS and JUONS—joint operational needs statements and operational needs statements—we are going to be able to take that, test it, integrate it, and make it so much better for the soldier downrange and rapidly get equipment to the soldier.

I will tell you, we have had an amazing thing with the Stryker double-V hull. Thanks to the next panel you are going to hear about—and Dr. Gilmore's team. You know, it is from January 10 until about 18 months, it will be—we are going to be putting in the hands of soldiers a brand new Stryker double-V hull that provides increased protection to them.

And that was tested in accordance to ensure that we really were putting a good piece of equipment in there. And we have done it in a year-and-a-half thanks to the great help that we got from the next panel you are going to hear from.

So I really hold a lot of—I am excited about what is going to happen at Fort Bliss and to be able to take this equipment and test it every single 4 months and get it through those integration challenges and into the hands of our soldiers. I think it is going to be big for our network and it is going to be big for other equipment we want to get in the hands of the warfighter as quickly as possible.

Mr. BARTLETT. Sir, how will the acquisition strategy change in light of this and how will competition be applied in production?

General PHILLIPS. Sir, one of the biggest challenges that we have in acquisition—Dr. O'Neill, the Army acquisition executive and myself—is the alignment of programs—program executive offices and program managers—in execution of the network strategy. It is the most important program that we will execute.

So what we are doing today is aligning programs that were just mentioned, like Joint Tactical Radio System and WIN–T, to align them with the strategy, doing the testing out at Fort Bliss, White Sands to make sure that the programs and the acquisition strategy is aligned with the needs of the Army in terms of our Army Force Generation, our ARFORGEN. And that piece of it we are going to work really hard.

Joint Tactical Radio System—I will talk a little bit about that. We are aligning the acquisition strategies; we are seeking to accelerate for the rifleman radio that was mentioned in the demonstration we just did down at Fort Bragg last week.

We are driving toward a Milestone C decision in July for airborne, maritime-fixed station JTRS. We are looking for a Milestone C in early fiscal year 2012; ground mobile radio for a Milestone C this year.

So we are driving the key components of the—or, I am sorry, the network strategy toward acquisition decisions on a short timeline and we are delivering. And I agree with my partner, Bob Lennox, that we have made great strides over the last year in JTRS as well as WIN–T. Critically important.

General CHIARELLI. And you said in your opening statement, Mr. Chairman, the key here is non-proprietary software. We call these

things radios. They are not radios; they are small computers. That is what they are. Different sizes of computers, I.P.-based.

And because we have non-proprietary waveforms in the soldier radio waveform—in all the waveforms—we don't care who builds the box as long as it carries our waveform. And that is the JTRS business model and that is going to spur competition.

And we are not going to necessarily go out and buy one for everyone to start with. We will let the competition make those boxes better and cheaper. That is the model—the business model that we have adopted with JTRS, and we are excited about it. And not everybody is, but we sure are.

Mr. BARTLETT. Thank you very much.

I have now one question, this for the record. Supplying our troops in Afghanistan has focused increased attention on a number of things, and one of them is the line haul tractor. I have been told the Army has not held a competition for the M915 line haul tractor in nearly 11 years.

Why would there not be a business case to pursue a full and open competition? Is the M915A5 basically a commercial vehicle or has it changed significantly in the last 10 to 15 years?

How does the Army know it is getting the best truck available for the best possible price? Is it possible that industry could provide a safer, more fuel-efficient truck at less cost than the Army is currently paying for the M915A5?

Does the Army plan to pursue a competitive procurement of line haul trucks in fiscal year 2018 in support of a new line haul capabilities production document requirement? You may answer this multifaceted question for the record.

[The information referred to can be found in the Appendix on page 111.]

Mr. BARTLETT. Thank you all very much for your testimony. Thank you for your service.

And we will recess this panel and empanel the next witnesses. Thank you very much.

Thank you, Gentlemen, for taking your time to join us. I have been to the floor a number of times to do a special order after the close of business. As they pan the floor you may note that there is nobody in the chamber but there are somewhere between 1.5 million and 2.5 million people watching in addition to staff and members in a lot of their offices.

I just returned from Afghanistan and I was surprised that soldiers there told me that they watched our hearings here. So although there are few of us here at the hearing be assured that there are many people watching this, so be careful what you say, and that this will be a part of the permanent record that people will pore over for quite a while to come.

Thank you very much for joining us.

Dr. Gilmore, please proceed, and you will be followed by Mr. Sullivan.

STATEMENT OF J. MICHAEL GILMORE, OPERATIONAL TEST AND EVALUATION, OFFICE OF THE SECRETARY OF DEFENSE

Mr. GILMORE. Chairman Bartlett, Congressman Reyes, members of the committee, I am happy to be here no matter how many of you are actually in the chamber. I consider it an honor to be here.

I will just very briefly summarize my written testimony, beginning with the results of testing of the Early or Enhanced Infantry Brigade Combat Team systems, then moving on to testing of Stryker double-V hull, which General Chiarelli referred to, and then closing with an assessment—a quick assessment—of the plans to continue testing our Army network systems over the next several years.

Unfortunately, with regard to the testing of the E–IBCT [Early–Infantry Brigade Combat Team] systems that was conducted last year, my assessment remains the same, actually, as it was based on the results of the testing that was conducted a year prior to that, which is that with the exception of the small unmanned ground vehicle the systems under test really demonstrated very little, if any, military utility.

The unattended ground sensors provided the test units little useful tactical intelligence. The images that they provided were frequently blank or contained little, if any, useful information.

The sensors were difficult to conceal and easily identified by the opposing force, which precluded their utility. Connecting them to the network was complex, and in fact, the majority of the time during a test the soldiers did not succeed in connecting the sensors to the network.

And also, since the information that was collected that was useful was useful primarily locally to the units that were actually in charge of the sensors there really wasn't much point in trying to connect the sensors to the network, although some of them can only be controlled if they are actually connected to the network.

The primary purpose of the network integration kit and its key component, the Joint Tactical Radio System ground mobile radio, which I will refer to as the GMR, is to provide the mobile adaptive Internet, enabling information from the sensors to be shared among all echelons of command during combat. Because the sensors provided essentially no useful information the key function that the NIK, the network integration kit, has was not demonstrated during the test.

Now, the NIK and the GMR, while providing the mobile adaptive Internet, actually have many more purposes than just that, and in fact, the GMR is planned to replace a number of the existing radios, including radios that provide secure voice communications for the soldiers. This was the first time that the secure voice communications capability of the GMR was tested under operationally realistic conditions, and 70 percent of the time it didn't work, which meant that the test units had to rely on the existing legacy radios that they had, or if they didn't have them they had to use runners, which is something that hasn't been done regularly since World War II.

The NIK startup and reboot times were very long, in excess of the 25-minute requirement. The NIK was complex to operate and

the soldiers expressed little confidence in it, frequently turning it off or putting it in standby when they went on offensive missions.

Also, there were critical information assurance vulnerabilities that were found in the NIK. Now, the Army reports that it has fixed the last three problems that I mentioned and we will have an opportunity to test those fixes during the upcoming tests this spring and this summer, that General Chiarelli mentioned and I will touch on briefly at the end of my remarks.

The Class 1 Block 0 Unmanned Aerial System was not useful in offensive operations due to its weight and bulkiness. It was not useful in situations requiring surprise because it is very loud.

It was most useful when used from a static defensive position, and it was meant to be used in much more—in many more situations than those. It was also unreliable and crashed.

The unit showed a preference for the existing Raven Unmanned Aerial System over the Class 1 UAS because the Raven is quieter, was easier to deploy, and had longer endurance.

The small unmanned ground vehicle, as I mentioned, did provide useful military capability. It can be used for remote investigation of potential threats, such as improvised explosive devices.

It is also used to support a range of other tactical missions, including clearing buildings or caves and traffic control points, but its utility is limited by the fact that—for example, in a building if it goes around a couple of a corners and the building has, you know, rather thick walls the operator loses radio communications with the unmanned ground vehicle and has to go retrieve it. And in a number of instances during the tests that exposed the operator and the operator was scored as being killed.

So there can be improvements made to the small unmanned ground vehicle but it does provide useful military capability.

There were several lessons learned, that I mentioned in my written testimony, from this experience with the E–IBCT systems. I think the most important one for me is that rigorous testing of these systems beginning as early as possible is really mandatory.

These systems originated in the Future Combat Systems program, which started back in 2000. After 9 years we did operationally realistic tests of these systems. We found that the majority of them didn't provide military utility.

I can say, I think without challenge, that that should have been discovered much sooner and could have been discovered much sooner if more rigorous developmental testing had been done than was.

With regard to the Stryker double-V-shaped hull, we have been doing a robust test program, both live fire and operational, of that vehicle to support deployment in June 2011. That is just one of many examples I can cite of doing rapid, robust testing to support rapid fielding of such a system.

The preliminary results of that live fire testing are very positive. It indicates that the Stryker double-V hull provides substantially increased protection to crew relative to the existing flat-bottom Strykers, as they are called, that are deployed in the theater.

But that testing also indicates—and it was the first time comprehensive testing was done of the existing flat-bottom Strykers—that they provide better-than-expected protection of the crew, and in fact, in a number of instances meet the threshold protection re-

quirements that are levied upon the all-terrain version of the mine resistant ambush protected vehicles. However, there is testing that remains to be done of the Stryker double-V hull in order to assure that all of its variants provide needed protection.

Nonetheless, I support fielding the system as soon as possible based on these test events.

As far as Army network testing is concerned, this summer's integrated network baseline event is going to be the Army's first major test within its fiscal year 2011–2012 integrated evaluation schedule, and General Chiarelli talked about his plan to do this continuous testing in order to support rapid fielding, and I certainly support that strongly. In this particular case this summer the Army intends to conduct six so-called limited user tests under operationally realistic conditions to support production or fielding decisions for systems, including the Joint Tactical Radio System ground mobile radio.

I am focused in that test, as far as the GMR is concerned, on demonstrating that, notwithstanding the somewhat disappointing results of the tests last year, that the radio can be used in a 20- to 30-node network to rapidly provide useful information to soldiers in combat on the battlefield.

I am concerned about the testing that is planned, primarily because in order to make this testing worthwhile the requisite planning has to be done and that is behind schedule. The individual systems that will compose the network, how they will interact with one another, where they will be deployed, at what echelons, is yet to be determined, even though we are supposed to start testing in June.

And the Army Test and Evaluation Command has not yet developed a plan for conducting the tests, collecting data, and evaluating the data. We are late to need for all that information and we are working with the Army to develop it as quickly as possible, but if we are not able to get that information in line here very quickly then we run a risk that this first major event will not produce all the information we need.

Thank you very much, and I look forward to your questions.

[The prepared statement of Mr. Gilmore can be found in the Appendix on page 76.]

Mr. BARTLETT. Thank you.

Mr. Sullivan.

STATEMENT OF MICHAEL J. SULLIVAN, DIRECTOR OF ACQUISITION AND SOURCING MANAGEMENT, GOVERNMENT ACCOUNTABILITY OFFICE

Mr. SULLIVAN. Chairman Bartlett, Ranking Member Reyes, members of the subcommittee, I am pleased to be here today to discuss Army modernization. My oral statement will focus on efforts to initiate the ground combat vehicle acquisition program, developments in the initial brigade combat team program, and emerging plans for the future tactical network. I have a written statement I would like to submit for the record.

I will begin with the ground combat vehicle program. After several false starts the Army now appears to have reduced the GCV's

expected capabilities in favor of a strong focus on mature technologies to control cost.

However, we believe there are critical questions that must be addressed as the Army begins technology development on that system. These include questions about the urgency of the need for the vehicle, the depth of the analysis supporting the preferred concept, the feasibility of a 7-year delivery schedule, and whether the program will be able to deliver key capabilities using only mature technologies.

It is imperative, in our opinion, that the Army demonstrate the match between those requirements it needs and the available resources before it proceeds past a Milestone B decision by the spring of 2013.

With regard to the first and second increments of the Initial Brigade and Combat Team Systems, the director of operational tests has indicated that most demonstrated little or no military utility in recent user tests. In response, the Army decided not to pursue the second increment and terminated all but two of the first increment's systems, the small unmanned ground vehicle and the network integration kit.

However, the Army still assesses the maturity of two technologies critical to the kit's performance: the wideband networking waveform and the soldier radio waveform. It has very low maturity at this point and still risky. We believe this raises legitimate questions about whether procurement of up to 181 units is appropriate at this time.

The results of these tests have prompted the Army to review its requirement-setting process to determine how validated requirements that have come through TRADOC [Training and Doctrine Command] can translate into little or no military utility. One explanation may be that these systems were spun out of the Future Combat System concept and the Army restructured the acquisitions without an adequate analysis of the new post-FCS operational environment.

Finally, the Army Tactical Network has recently been established as a special interest portfolio. I think the last panel talked a little bit about that. The Army is now developing an integrated network architecture and a comprehensive acquisition strategy for it and plans to deliver that strategy, we have been told, sometime this month, in March. The Army's first step is to establish an understanding of the network requirements and develop strategies to manage a number of communications command and control acquisitions in a coordinated fashion.

These recent developments in Army acquisition present new questions for the Army that it really must address. It is not helpful to promise early capabilities, as we have seen here, if they are not technically mature or reliable.

Last year we cautioned that moving too fast with immature designs could cause additional delays as contractors concurrently address technology, design, and production issues. The Army must now incorporate that lesson as it examines its current acquisition strategies.

After a rough start the Army has shown a willingness to rethink its original ground combat vehicle acquisition approach, for exam-

ple. However, the acquisition strategy is still very ambitious, allowing just 4 years of product development before delivering its first vehicle.

During the next 2 years in technology development the Army must determine whether this proposed timeframe is sufficient. If not, it must be prepared to add time and resources to the development of the ground combat vehicle and it must retain the flexibility and the resolve, frankly, to ensure that the right work gets done now. And that means good systems engineering, good technology development, and good requirements definition.

The GCV acquisition, if done right, could be a breakthrough for Army acquisitions. However, if the risks are not appropriately accounted for right now it could end up in the same failed position that the Army found itself in with the FCS and other programs.

More importantly, decisions on whether and how the ground combat vehicle program enters the acquisition process will define how recent acquisition reform legislation will actually be implemented. These decisions will be symbolic, from that standpoint.

The Congress and the department have enacted acquisition reforms in both legislation and policy, and now is the time to enforce those reforms by making the tough decisions at the service, the department, and at the congressional levels. If this program does not measure up to the standards in law and in policy, yet is approved and wins funding, it will be a setback to acquisition reform.

Mr. Chairman, that concludes my prepared statement. I will be happy to answer any questions.

[The joint prepared statement of Mr. Sullivan and Mr. Graveline can be found in the Appendix on page 86.]

Mr. BARTLETT. Thank you.

Thank you, Mr. Graveline, for joining us. I understand you will be available for questions.

Mr. GRAVELINE. Yes, sir. Happy to be here.

Mr. BARTLETT. Thank you.

Let me turn now to my good friend and ranking member, Mr. Reyes.

Mr. REYES. Thank you, Mr. Chairman.

Dr. Gilmore, in your testimony you raised some concerns about how the Army will conduct a major network testing event at Fort Bliss this summer, as you made mention. Can you be a little more specific about your concerns, aside from the comments that you made in—I guess putting it in context in terms of the requirement to be able to function in an integrated manner?

Mr. GILMORE. My concern is that we don't know how many GMRs are going to be in the test. We don't know what units will have them at what levels. We don't know what kind of information the test units will try to transmit over the mobile Internet.

Absent that kind of information, it is very difficult to plan for the test. We also don't know the same thing for WIN–T and some of the other systems that are going to be tested.

We don't know what the Army's plan is for collecting data. We don't know that the Army is going to have sufficient capacity to collect the digital information needed to do a full assessment of the performance of the systems.

These are things that we would expect, at this point, to already know. Hopefully we will know them by the middle of this month, around the 18th of March. That is the current schedule on which this information should be provided. However, originally it was supposed to have been provided a month ago.

And if we are going to start testing in June and we don't know how many radios are going to be on the—you know, on the—in the test, who is going to be using them, what they are going to be trying to use them to do, how the information is going to be collected, that is a concern.

Mr. REYES. If you were us, what would be your recommendations as to the—first of all, the ability to conduct the test; secondly, the ability to track the data that you are concerned about; and third, how the results would be utilized? What would be your recommendations?

Mr. GILMORE. First of all, we can conduct the tests but we have to plan appropriately and we have to have enough time to do that planning. In fact, that was a lesson learned from the operational testing of the E–IBCT systems in 2009, where we had a good plan but we couldn't execute it and so we didn't get as much information as we needed in 2009.

We can conduct the tests. We need sufficient time to plan them and we need to make sure that the Army Test and Evaluation Command is staffed and has the infrastructure necessary to collect the data and analyze it.

So at this point my recommendation would be—and this may be not greeted with joy by some senior leaders in the Army—my recommendation would be that we wait until the end of the window for testing this summer in order to do the test. There is a window over which it could be conducted.

Currently, it is planned to begin at the beginning of that window, at the earliest possible time. I would recommend, at this point, that we look hard at giving ourselves a little more time to plan the test—not delaying it, you know, a significantly long amount of time, but maybe delaying it about 6 weeks so that we have sufficient time to plan the test so that it can be executed in such a way that it gives us the information that we really need to support General Chiarelli's desire—and I fully support it—to get this equipment out into the field as quickly as we can.

Mr. REYES. So based on your work, your concerns are predicated on either the lack of information, or lack of access to the information, or—what is the basis for your——

Mr. GILMORE. It is not the lack of access to information. We are working well with the Army. They are sharing information as they have it, so there is no problem with access to information. It is just they have not yet been able to figure this out.

And that is not a criticism of, you know, of the Army. I don't mean this as a harsh criticism at all. This is going to be one of the most complex tests the Army has ever conducted of its communication systems, and it will be a comprehensive test. And I support it. We need to do comprehensive tests of these networks.

But, because it is comprehensive and it is so complex—and this is the first time we are attempting it, so we are just beginning to learn how to do this—we need to make sure that we have enough

time to make this test a success. And then as we move forward we will learn and we will be able to support the Army's desire and General Chiarelli's vision to do these tests every few months, every year, and have them yield the information we need to get this equipment out into the field quickly.

But this is the first one. It is very complex, and so I would recommend that we take a little more time to make sure that it is a success.

Mr. REYES. I guess the obvious question is, have you made those recommendations and what have—what has the Army——

Mr. GILMORE. I have discussed this with General Dellarocco, who is the commander of the Army Test and Evaluation Command, and we are working on it. He shares a number of my concerns. Of course, he and the Army leadership are reluctant, until they absolutely have to, to admit that a delay may be in order.

And they may come up with this information in the next couple of weeks and it may be sufficiently comprehensive that I would then evaluate that a delay is not needed. I don't mean to completely prejudge this. I am just expressing a concern because this information is already late to need.

Mr. REYES. Okay. Thank you.

Just one more question for Mr. Sullivan.

In your testimony you raised concerns about the 7-year schedule to the ground combat vehicle.

Mr. SULLIVAN. Yes, sir.

Mr. REYES. However, the Army is still evaluating, as we understand it, the three bids it received from the defense industry. So I guess what I am wondering is how can you assess that the schedule is "high risk" if you haven't seen what the different companies will propose?

Mr. SULLIVAN. Well, I think, I guess to clarify that a little bit, it is not necessarily that we see it at high risk at this point. We haven't seen enough, I guess. But just judging from past history and how these programs have gone before, 7 years is a very ambitious schedule. So what we have is a lot of questions.

I think that is probably—you know, right now there are a lot of questions and it may take a year or so to sort these out. But what we are really concerned about is if, when they do get to a Milestone A and a Milestone B we want to make sure that the decision-makers make decisions based on really good knowledge.

So, you know, what we look for is the maturity of the technologies they are using and to make sure that their required capabilities they are going for are really doable. Right now we are waiting to see. I guess that is the best way to put it.

Mr. REYES. Fair enough. And since the Army has stated that they are taking an incremental approach to the development is it possible that the, you know, that the first phase, the first increment will not achieve all the requirements based on the benchmarks and that it is designed that way, to——

Mr. SULLIVAN. Yes. In fact, we would——

Mr. REYES [continuing]. Develop it slowly—slower and more methodically?

Mr. SULLIVAN. Yes, sir. In fact, that is what we have advocated. And, you know, we have done a lot of work looking at best prac-

tices on how to develop products and we have always said that the—if you can do it in a knowledge-based way, you know, where you really, truly understand your requirements and you do it incrementally, not in such a revolutionary fashion, you know, like a lot of the weapon systems where they begin inventing things, that is the best way to do it because you—as long as you are delivering needed value to the warfighter and improved value over what they have and you are getting that to the warfighter a lot quicker, we see that as a win-win.

So the first increment, you know, not being real sexy and a big bang or anything, we—you know, as long as it meets the warfighter's needs that is a good thing.

Mr. REYES. And based on General Chiarelli's testimony earlier, the manner in which the Abrams tank—you know, he mentioned it has been upgraded numerous times and that is basically, at least the way I understood it, that is basically the approach they are using for the GCV. Is that, in your mind, a good approach? Is that——

Mr. SULLIVAN. That is the approach we would actually like to see. We will believe it when we see it, I guess, is one way to put it.

Mr. REYES. All right. Thank you.

Thank you, Mr. Chairman.

Mr. BARTLETT. Thank you very much.

Dr. Gilmore, one of the striking outcomes of the 2010 limited tester using of the Early–Infantry Brigade Combat Team equipment was that a majority of performance requirements were demonstrated, but in spite of that the equipment provided little or no military utility for the force. How could this have happened, sir?

Mr. GILMORE. I can't give you a completely definitive answer. I can give you my impressions.

The requirements that existed tended to be, for the most part, what I would characterize as technical performance specifications that engineers could relatively easily measure. So there were requirements for the resolution of the cameras used in the unattended ground sensors, for example.

What the requirements didn't specify was that the sensors should be capable of being easily concealed. This was a problem for both sets of sensors—the urban unattended ground sensors, which are, you know, similar in appearance to the kinds of sensors that the alarm company I use in my home sticks up on my wall, as well as the tactical unattended ground sensors, which are larger sensor sets that are placed outside.

One of the problems with those—well, there were several problems with them, but one of the problems with those is that in order to connect to the network there is a large antenna that sticks up where the sensor field is, basically saying, "In case, enemy, you were wondering where the sensors are, they are right over here where this antenna is."

So the primary problems seem to be—and this is not unique to Army programs—is that the requirements were stated mostly in terms of technical specifications that were easily measured—and they must—and those technical specifications certainly have to be satisfied in order for the systems to be useful. In other words, the

camera did have to have sufficient resolution for you to be able to recognize a face, for example, or recognize a human versus someone else—something else. But they aren't sufficient to guarantee military utility.

To fix this problem—and in fact, I think the Decker-Wagner panel, in its recommendations, addressed some of these problems with requirements, and I agree with a number of their findings, but we need to get the operators involved much sooner in the development of requirements. It shouldn't be a bureaucratic process. The operators need to get involved early on.

And I would suggest that the testers should get involved early on, particularly people from my office. The law last year made my office an official advisor to the Joint Requirements Oversight Council, and I view that as a good thing. We are participating in JROC [Joint Requirements Oversight Council] deliberations.

But that is not sufficient. We have to get involved earlier in the—when the services themselves, before they bring the requirements to the JROC, when they are actually developing them, to give them our perspectives and our lessons learned on what we have found useful when we have done testing and what we haven't. And we also monitor what goes on in the field.

And then also, we can advise them on whether requirements are technically realistic or not, based on our experience. And then when they are technically realistic, if they are, we can advise them on what the implications are for testing of those requirements.

So getting more people involved earlier, particularly the real operators and the testers who have a lot of experience, would be very useful. And I think that that is consistent with some of the recommendations made by the Decker-Wagner panel.

Mr. BARTLETT. Thank you.

We understand that the results of the 2009 limited tester—user testing were obscured by poor reliability of the equipment being tested. Are you more confident with the results of the 2010 limited user testing?

Mr. GILMORE. Yes, I am. The reliability of many of the systems was, as you note, very poor in the 2009 testing, but with regard to operational effectiveness we saw many of the same things in 2010, albeit with substantially improved reliability, with the exception of systems like the unmanned aerial system—we saw, essentially, the same kinds of things.

In the 2009 limited user test we saw that the majority of the images taken by both sets of sensors were blank or blurry and didn't provide useful information. We saw that the UAS was noisy and difficult to pack around and had limited utility.

So unfortunately the answer is yes, I am—you know, I am confident that the assessment that we generated is correct.

Mr. BARTLETT. In regard to weapon systems taking too long to get into production, some believe that we might shorten that time by reducing the quantity of testing. Can you—in this regard what should the individual services be doing that they currently aren't now doing to work more effectively and efficiently with your organization?

Mr. GILMORE. Let me comment first on this proposition that we should be, you know, cutting back on testing. My office doesn't

want to do gold-plated testing. We don't want to do any more testing than is required.

But we do want to do testing that is sufficiently robust so that decisionmakers here in the Congress and in the executive branch have the information they need as quickly as they can get it to make decisions on these systems, which frequently cost many billions if not tens-of-billions of dollars, and that is an important mission my office has under the law. But even more importantly, we want the information to be available to the commanders in the field and the soldiers in the field so that they understand what they are getting and, just as importantly, what they are not getting.

And my office has demonstrated, in the case of double-V hull, in the case of testing of the mine resistant ambush protected vehicles—both the original versions of the vehicles and then the all-terrain versions of the vehicles—and the ongoing testing of the Gray Eagle ER/MP [Extended-Range/Multi-Purpose] UAV, in which my office took the initiative to combine testing and training at the National Training Center so that we could not only get test data but also train the units, because we saw that they weren't being trained sufficiently when they were being deployed as part of the quick reaction packages that are now being deployed to Afghanistan.

We want to do testing as quickly as possible to get equipment that works into the field so that the soldiers in combat can use it. But what I mentioned as a lesson learned here I think is a clear lesson learned, and that is, to do that—to get equipment into the field quickly—you need to do robust, rigorous testing early and often.

And so one of the things that I have been pushing, even though I am in charge of operational testing—the law says I can advise on developmental testing. I have been pushing for earlier, more rigorous developmental testing, and I see that, unfortunately, in many instances, including the E–IBCT systems, that hasn't been done. We need to do that.

Then I will not be giving you these pessimistic operational test reports, which I do not enjoy giving you. It is much better if we can detect these problems early when they can be fixed more cheaply or we can make an informed decision that, you know, fixing these problems really isn't going to be cost effective. It isn't really going to be feasible. We need to stop and pursue a different approach.

So I think it is key to do rigorous, robust testing—not gold-plated testing. If we do it and if we plan for it, that will enable us to get these systems into the field more quickly. Not as quickly as we often plan for, because unfortunately the Department of Defense still is the department of wishful thinking in many ways, but more quickly than will otherwise happen if we have to redo tests, redesign equipment, restructure programs, with all the efficiency and increased costs that that yields. So I hope that answers your question, Mr. Chairman.

Mr. BARTLETT. Thank you.

In your testimony you mentioned that developmental testing is a key to successful operational testing. How can we improve the relationship between developmental testing and operational testing?

Mr. GILMORE. Oh, and this gets to the one question that you asked me previously that I actually didn't answer, and so I will try to do that now: You need to get the testers involved early. Just as I said we need to be involved early in the development of requirements, we need to be involved early in the programs, once the program's offices are set up and once the program managers are installed.

And we are willing to do that; we are doing that. For example, we have done it in Stryker double-V hull. We are doing it in Gray Eagle. I can go down the list.

If you get the testers involved early—and I can cite you many examples in all of the services where that is happening; I can also cite you some examples where it is not happening. For example, it didn't occur in the Joint Strike Fighter program until within the last year-and-a-half, and particularly with the advent of Admiral Venlet taking charge of that program.

The restructuring that occurred in JSF [Joint Strike Fighter] under Secretary Carter and Admiral Venlet—it dealt with problems that are mentioned in detail in several of the DOT&E [Director, Operational Test & Evaluation] annual reports preceding my assumption of this office but continuing in the report that I issued last year—in the reports I issued last year and this year.

So getting us involved, having a dialogue with us, listening to our concerns, let us understand what the concerns of the program managers are because they are always under the gun for time and schedule and we understand that and we want to help them out in both regards—but getting us involved early and getting the developmental testers involved earlier, and doing more robust governmental testing as well as contractor testing—on a number of these contractors that have been led over the last decade we have been relying on the contractors to do the testing and the record is not very good, so I think we need to reinvigorate government developmental testing. All those things will clearly help.

Mr. BARTLETT. Sir, across the department we have trouble during operational testing. How much of that do you think is due to a lack of quality developmental testing along with trying to test immature technologies?

Mr. GILMORE. The short answer is, much of it. I think it was true in the case of E–IBCT. It has been true, for—another example is the advanced anti-radiation guided missile.

Early last year I was presented a test plan for operational testing of that missile. I reviewed the developmental testing that had been done, which was just a few shots. My response was, to the Navy acquisition leadership, "I am not going to prevent you from going to operational testing because I know you will learn a lot from it, but I think you are also going to be disappointed by the results."

So they took the missiles, they put them on the aircraft, and the missiles started to fail for a variety of different reasons. A variety of different failure modes manifested themselves.

The planes would take off, the operational test squadron; they would have to turn back because the missiles failed and couldn't be fired. This happened so often that the operational—the commander of the operational test squadron said, "'We are going to

stop testing. We can't fire the missiles. We can't test. And there are so many different failures occurring we don't know what is happening."

So they stopped the operational test, which was unfortunately what I had thought would probably happen, based on my review of what the developmental testing had been—was. Now they have been working on the missiles to try and fix the problems. I got a report just last week that they have, unfortunately, still been exhibiting a lot of failures, many of which are not yet completely understood.

These are problems that should not surface for the first time during operational testing. They should be worked out during developmental testing, and unfortunately they are not.

So again, the short answer to your question is yes, that is clearly a problem and I hope that we can work to fix it. Now, it is hard. It is hard even when budgets are fat, and the budgets are not fat now.

And it is very hard for a program manager who is under the gun for budget and schedule to take additional time and spend additional money for testing. Then it comes to operational tests and I have to report very straightforwardly, both to the Secretary of Defense and to you, what the results are.

And those results, when they are stark and they are publicized in that manner, then force them to go back and restructure the program and relook. And that is a good thing—better late than never—but it would be much, much better if that happened sooner.

Mr. BARTLETT. Thank you. Thank you very much.

Mr. Sullivan, as the Army proceeds to implement its network investment strategy what advice would you offer the Army on how to proceed? What are the major areas of risk for the Army to focus its management attention?

Mr. SULLIVAN. Well, I think most importantly is the idea that they do it incrementally, you know, which I think they are trying to do now anyway. And the director here has been talking an awful lot about developmental testing and immature technologies and things like that. I think they have to work with technologies in advance in order to make sure they are mature.

As we know, the network integration kits, for example have immature technologies. They were ready to go to procurement with this. In fact, they procured 81 kits already and they still have immature technologies on that.

So in a way I think they are doing a lot of the things that we probably would recommend, and maybe Mr. Graveline could weigh in on this. But they are taking an incremental approach. They are kind of decentralizing this.

This is not the Future Combat Systems system of systems operation anymore, and they are not relying as much on the information and—you know, the ground combat vehicle, for example, is going to be a big, heavy vehicle again so that, you know, it can have a lot of power and carry a lot of subsystems. They have reduced the emphasis on information cutting through the fog of war.

I don't know, Bill, if you have anything to add.

Mr. GRAVELINE. I would just echo some of the things that Mike said, was about the incremental approach, and building on the cur-

rent foundation of the network that they already have, because there are already a lot of the pieces are in place in the current forces now. And then secondly, their approach for demonstrating on a regular basis at Fort Bliss, building up the network over time there, having the operational forces working with it on a regular basis, working out the bugs, learning the best ways how to use it, that is just—it is a very good approach.

Mr. BARTLETT. Thank you.

As the Army approaches the launch of the technology development phase of the ground combat vehicle what do you see as the major areas of risk for this program to meet its performance expectations within 7 years?

Mr. SULLIVAN. I think, as I was talking with Congressman Reyes about that, it is hard to tell right now really what the risks are. We do know that they had an extreme amount of risk, I think, with their first RFP in the areas of armor. You know, I think they had a lot of very, very immature technologies they were looking for for armor protection, and then a lot of the sensors on there, a lot of the 360-degree protection that they were looking for was calling for technologies that were pretty high-risk and pretty immature.

Now, they pulled back the RFP. They looked at it again and we have been told that they reduced the need for a lot of those technologies. They have reduced the capability in order to be able to control time and cost a little bit more.

The question—so there is a risk there—are they going to get enough bang for their buck? And, you know, that is kind of the balance, I think, that you have to play when you try to go for an incremental approach like that.

So the risk on ground combat vehicle now is, number one, we probably would like to take a better look at what the RFP really calls for, what technologies they are trying to integrate into a system, and then in that short period of time whether or not they can do, you know, kind of a clean sheet of paper design. There is a lot of integration risk, I guess, too—not just technology, but system integration risk. They need a lot of systems engineering done early on that program.

Mr. BARTLETT. You questioned in your written statement whether the Army's final assessment of the reduced GCV requirements during its analysis of alternatives was sufficiently robust. Can you expand a bit on this?

Mr. SULLIVAN. Yes. I think when we looked at the first RFP that went out—first of all, they initiated the beginnings of the program before the analysis of alternatives was complete, so they kind of had an RFP out there for some exotic technologies needed to meet the capabilities before they had the analysis done. When the analysis—the original analysis of alternatives came in for the first set of requirements it came in and said that this was a very risky—basically there was no way that they could accomplish this in 7 years; there was too much technology risk, too much integration risk, you know, the industrial base probably wasn't fully prepared for this.

But that is when the Army take it—and they said, I think they put an estimate on the eventual unit cost of the ground combat vehicle somewhere between $18 million and $23 million, which bust-

ed the Army's budget. The Army is looking for a target of somewhere around $10 million.

To the Army's credit, that is when they pulled that RFP back. When they sent the new one out with the new set of requirements that were lower the analysis team looked at that again but we don't believe that they did a full analysis. In fact, we would recommend—one thing that we would recommend at this point in the ground combat vehicle is that they do a robust, very quantitative analysis of this new RFP before they get too much further down the road.

They did a kind of a qualitative assessment. I don't want to—the team looked at it. They didn't do the modeling and simulation they had done before, they just kind of looked at the changes they made and looked at the delta and said, "Yes, this looks less risky," more or less.

Mr. BARTLETT. I have a couple questions about lessons we learned with the procurement of MRAPs. How long was it from "we need it" to "we had it"?

Mr. SULLIVAN. Well, I will be a little bit fuzzy on this but I think it was within a couple of years when they—you know, once an urgent need statement went in to the time they delivered the first systems I think was within 2 years. Is that right?

Mr. GRAVELINE. Yes, I believe so. There seemed to be some lag from the—there was some tracing back of the original needs from the warfighters, and that seemed to take some time to get up to the right levels and get the needs statements——

Mr. SULLIVAN. But suffice it to say it was an efficient process.

Mr. GRAVELINE. Yes.

Mr. BARTLETT. It certainly was. And is the ground combat vehicle so enormously more complex? Does it have so many more required capabilities?

My understanding is that MRAPs have done pretty much what we wanted it to do and we kind of bypassed all of our very meticulous checkpoints to get it there as quickly as we could and we really did. We got it there in a couple of years.

You are looking at a program here that is 7 years—three-and-a-half times longer—and you are questioning whether it is doable or not? What kind of lessons have we learned from the procurement of MRAPs that might help us here? Do we really need to go through—this really was revolutionary, wasn't it?

Mr. SULLIVAN. Well, the MRAP—it was—it certainly was an incredible development and acquisition program to meet an extremely urgent need. It met the need.

I don't know that it was a revolutionary—I mean, basically what they did——

Mr. BARTLETT. I didn't mean, sir, that the platform was revolutionary——

Mr. SULLIVAN. Right.

Mr. BARTLETT [continuing]. I meant the procurement was revolutionary.

Mr. SULLIVAN. The speed of time it took for them to get that fielded was incredible.

Mr. BARTLETT. It was incredible.

Mr. GILMORE. Mr. Chairman, could I——

Mr. BARTLETT. Yes.

Mr. GILMORE [continuing]. Offer something here?

We were already building—MRAPs were already being built. It is a very heavy armored truck. It was not a great leap forward in technology.

Mr. BARTLETT. But it met our needs, did it not?

Mr. GILMORE. And it met our needs——

Mr. BARTLETT [continuing]. The question, do we really need all of these technologies to meet our needs since the MRAPs obviously did?

Mr. GILMORE. It depends upon what those needs are. The needs in the case of MRAP were clear and relatively simple: Protect crew from underbody blasts——

Mr. BARTLETT. Right.

Mr. GILMORE [continuing]. Which was actually something the Army hadn't really thought about a lot prior to the experience in Iraq because it hadn't had that experience. The South Africans had and so they had already designed the predecessors of the MRAPs that we have and were already building them, as were others.

So if you are not going to take a revolutionary leap forward you can design and test in parallel, and produce in parallel with testing, and get the equipment into the field very quickly.

And, you know, is it possible, in my view, to do a ground combat vehicle in 7 years or even less than 7 years? Yes. But it depends upon what kind of requirements you are trying to impose.

If you are trying to impose a great leap forward in sensor technology or active protection system technology then you may need 7 years or you may need more. If you are trying to build an upgraded version of a Bradley you can do that relatively quickly.

So, you know, the requirements and the schedule go together. And by the way, the budgets are coupled in there, too; the costs are coupled in there, too.

Now, I have heard—and, you know, it is expressed by senior leaders in the Army, "Well, only once every 20 years or so do we get an opportunity to build a new ground combat vehicle so we want to get the best that we possibly can," and I understand that view. But if we want to get the best that we possibly can and that turns into a revolutionary leap forward then it will take time to get it. If we are willing to settle for somewhat less then we can do it more quickly.

Mr. BARTLETT. Mr. Sullivan.

Mr. SULLIVAN. One thing I would say about the ground combat vehicle now is that if you think about it, really they are doing, you know—what we are talking about really, the period of time where you are investing very, very large sums of money in product development, that really isn't going to begin on that program until 2013. So what they are talking about is that product development period of really only 4 years.

This 2-year period they are going to do now is kind of, you know, playing around with technologies and risk and kind of playing in the sandbox stuff with—I mean, I know it is a lot of money but it is a lot less money than when they finally say, "Okay, we are going to start integrating these products and doing all the full-scale test-

ing on them." So I think we are probably talking about 4 years, which is a little less.

And then I would say that probably, because it is kind of a clean sheet of paper, it is going to have more capability and probably be at more risk than an MRAP. It is going to be a combat vehicle. It probably will be a little—it will take a little more time.

But I get what you are saying.

Mr. BARTLETT. Mr. Reyes has a comment, observation, question.

Mr. REYES. Well, you know, and mine is predicated on the issue of immature technologies. For instance, sensors—we were dropping long-range reconnaissance patrols on the Ho Chi Minh Trail north of the DMZ [Demilitarized Zone] in 1967, 1968, and they were—they had these PSIDs, the portable seismic intrusion devices, they were called, that they would just lay on the trails because there there were no friendlies. All they needed to know was that there was an alert, that there was somebody coming at them on these various trails so they would put those out there to be able to respond and they would put clamores and all these other kinds of protective devices in place.

But my point of that is in 1972, when I was then in the border patrol, we were using these PSIDs, you know, surplus from Vietnam in the border patrol in 1972. So sensors have been around for 40-plus years now that I personally worked with, and I saw—Fort Bliss is in my district, so I saw a lot of the soldiers that came back from—mostly veterans from Iraq—that got a chance to evaluate the sensors, the robots. You have the "flying keg" [Honeywell gas-powered Micro Air Vehicle], you know, if the wind was too high it wouldn't maneuver right and all of these other things, but I can tell you, those soldiers were very much impressed and said, "We wish we could have had these first," and some were veterans of Fallujah, and they wished that they could have used robots to go down those alleys rather than soldiers, their buddies that got killed because they went down those alleys.

So when we talk about immature technologies we are not talking—I hope we are not talking about sensors and we are not talking about robots, because they have been around a long time. We have seen them evolve very quickly, as the chairman has said.

You know, in wartime we have the capacity and the capability to accelerate these things because lives are on the line. I was with Chairman Hunter, and as the chairman here was, when we went to Quantico to test some of the armor repulsive capability to do the V-hull and the MRAPs and stuff like that. So I, like the chairman, think—I am all for testing and I am all for making sure that we follow the carpenter's rule, measure twice and cut once, but we just have to streamline this process because we have seen it done better.

And that is why I wanted to comment on the immature technologies, because they—sensors have been around, you know, in my lifetime since I was a soldier going into North Vietnam to drop these LRRPs [Long Range Reconnaissance Patrols] in there. And I was—frankly, I was amazed that we were, still in the combat evaluation brigade, that we were still evaluating these things.

And I guess when I asked the questions they said it is because they have to be part of the network. And it is not just the squad

that is using these things, like the LRRPs, that are going to have to maneuver and respond to them; they want to have it at the—I guess at the company level, at the battalion level, so that they can see a fuller picture of what the battlefield looks like. That was the reason that they gave me why they needed to be a little more complex.

But they were—border patrol today is using those. They bury the battery and there is nothing that sticks out except a little reed-like antenna. So the capability to hide them was not an issue.

Mr. SULLIVAN. Well, yes, I think that is an instance where you are certainly not gold-plating the requirements, right? They are using pretty much what they need.

Mr. REYES. Right.

Mr. SULLIVAN. And, you know, I would say there are a lot of programs—acquisition—if you look at the F–16, for example, there is a pretty high-tech instrument, and that was a—really when you look at it it was an incremental. The sensors on the F–16—you know, all those sensors weren't on there on the first one that came out in the 1970s, right? But they were able to—they worked the tech base.

And I think sensors and subsystems do this a lot better. When you have a platform like a ground combat vehicle, which will eventually grow into all of these sensors as they develop, that is something different. You know, that is where you are—you have got to get the technologies right on that.

But, you know, you do see a lot—F–16, F–15 were examples of pretty good acquisitions where they did that incrementally, and you can take advantage of—you know, you grow the sensors and grow their capabilities in the tech base. You know, you invent and do trial and error with the S&T [Science & Technology] money, and when they are ready they should be able to snap into a ground combat vehicle.

That is another thing about this is open systems architecture is critical for all of that.

Mr. BARTLETT. That was going to be my final question: When will we know enough about spiral development and open architecture so that we can start with a platform like the MRAPs and then have it current with technology for the next 30, 40 years of its life?

Couldn't we shorten these programs? Now we try to build into the original platform all the bells and whistles that are conceivable. Wouldn't it be better to start simple and put them in when we know that we are really mature?

How far are we away from our ability to do a spiral development with open architecture so that we can do this?

Mr. SULLIVAN. Well, I would hope that the Army, with the ground combat—that is one of the things that, for example, we would be looking for if we were asked to go in at Milestone B, where they make the business case. You know, we have looked at the capabilities, we have system engineered them, we have looked at the technologies needed, we know they are mature. So if you have a business case that has a lot of knowledge about what you are going to build, it is not too big, it has open systems architecture, for example, and it is going to be the first increment but we are going to put space, power, and cooling in there and pay atten-

tion to open systems so as new technologies come available we can snap them in, you know plug and play—we would expect that—that is something that we would be looking for on the ground combat vehicle.

Mr. GILMORE. I would just say, I think we can do it now. It is just a matter of deciding to do it.

Mr. BARTLETT. So why don't——

Mr. GILMORE. I would also say we have done it before, perhaps not with as much forethought as you are engaging in. But the B–52 has been around for a very, very long time. It has seen many different uses.

At the time it was built people decided to build a long-range aircraft that could carry a lot of payload and they did the best job of it that they could. They probably didn't try to engage in some big analysis of what would happen even 10 years in the future because they couldn't foresee it, but they built a good truck of an aircraft at the time—the best one that they could build—and it has had a lot of use since then.

So I think it is more than just thinking about the technologies that are available. It is shifting your view of what it is you want to do and changing the culture of it.

Mr. BARTLETT. I have one last, last question. Sometimes you can get 95 percent of the way there for half the cost of getting 100 percent of the way there. Who is making those kind of judgments as we move along?

Mr. GILMORE. Well, I would say that Secretary Gates has been making them. And not everyone agrees with all of the decisions——

Mr. BARTLETT. But there are thousands of these little things along the way in development and, you know, you ask for something and if you only needed 95 percent of that you might get it 2 years quicker and at half the cost. Who is out there looking at these things saying, "Hey, guys, do you really need 100 percent? Won't 95 percent do okay because it will cost half as much and you will get it in half the time"? Who is doing that kind of thing and looking at these——

Mr. GILMORE. I would say that Secretary Carter is doing that.

Mr. BARTLETT. Okay.

Mr. GILMORE. He has done it on ground combat vehicle.

I would say that General Chiarelli is doing that, and Secretary McHugh are doing that——

Mr. BARTLETT. That is kind of a 30,000-foot evaluation and I would like to see it down at the——

Mr. GILMORE. I understand. But Under Secretary Westphal is also getting into it. Under Secretary Westphal and General Chiarelli are participating in these acquisition portfolio reviews and they are bringing in their subordinates to do this, and I would say in some sense they are training their subordinates to do that, who will eventually replace them.

I would agree with you that there is a way to go in terms of getting those kinds of ideas and that way of thinking down lower into the service requirements organizations and so forth, but clearly General Chiarelli and the Army leadership are trying to do that. Secretary Gates is trying to do that. For example, you know, his push to get Intelligence, Surveillance & Reconnaissance capabilities

into the theater as quickly as possible, and I think he engaged in some teachable moments with the Air Force leadership in that regard.

And I agree with you if your point is that is shouldn't have to happen at the level of Secretary Gates. That is absolutely true. But it has to start somewhere and sometimes it has to start at the top and percolate down.

Also, constrained budgets are going to play a big role here. There will be no choice but to try to go for the 50- and 75-percent solutions because the 90- or 95-percent solutions simply won't be affordable.

Mr. BARTLETT. Sir, by the time the Secretary gets involved we are several billions down the road and several years late. I would just like to see it start at the very beginning. Do you really need that? Because if you only have to get 95 percent of that can you live with that? That would only cost you half as much.

People need to be asking those questions all along the line, and my perception is those questions don't get asked. You just take it as a requirement and try to fulfill it, never telling them, "Gee, do you really need that requirement or would 95 percent of that be okay and that would really cost you a whole lot less?"

Mr. SULLIVAN. The director made a good point a while back, and I think that, you know, the culture has an awful lot to do with this. The Army says we get to do this ground combat vehicle; this is our only chance in 20 years. They are going to gold-plate those requirements. They are going to make sure that this is the best thing since sliced bread.

And that culture probably has to change a little bit, but——

Mr. BARTLETT. If you will excuse us for just a moment to welcome an old and dear friend.

Mr. GILMORE. Certainly, sir.

Mr. BARTLETT. You will recognize him from his picture on the wall.

Mr. SULLIVAN. That is Morgan Freeman, right?

Mr. BARTLETT. When he sat here I sat down there at that first chair 18 years ago.

Mr. SULLIVAN. The only point I guess I would make, there are pockets of what you are talking about out there. Every once in a while they try it. You know, I would reach back to, like, JDAM [Joint Direct Attack Munition], the precision kit that was a simple, kind of, you know, a very unsexy thing that did a lot for precision strike, right? That was an 80-percent solution.

And I think there are some systems now. I think of P–8A [Boeing Poseidon maritime patrol and reconnaissance aircraft], for example, which I think has made some pretty good trades—you know, not gold-plated, just trying to get the job done. And the reason is is because they need it because the system that it is replacing is getting really old. So, you know, when forced to good decisions can get made.

Mr. BARTLETT. Thank you.

You have been a great panel. Thank you very, very much for your testimony and your service.

[Whereupon, at 4:14 p.m., the subcommittee was adjourned.]

A P P E N D I X

March 9, 2011

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 9, 2011

Statement of Chairman Roscoe G. Bartlett (R–Maryland)

House Subcommittee on Tactical Air and Land Forces

Hearing on

Army Modernization

March 9, 2011

I just returned from having led a delegation of Members on a visit to Afghanistan, where we met with personnel from all of our services at several different locations in Afghanistan. While I have always had misgivings about our involvement in Afghanistan, I want to note how I was again so highly impressed with the extraordinary courage, dedication and sacrifice demonstrated every hour of every day by our service personnel.

We have always done our best to make sure our personnel have what they need to execute their missions. I have been reenergized by this most recent experience to make sure we do all we can to support the absolutely outstanding men and women serving our nation.

In terms of this year's budget request, the Army's top two modernization priorities are the tactical network and the Ground Combat Vehicle (GCV) programs.

However, I would maintain that the number one modernization priority remains soldier equipment. In saying that, I don't mean to imply that properly equipping the soldier hasn't always been a priority, especially for the witnesses in front of us today, whom I know share that concern.

There is no doubt that the equipment and body armor that our soldiers have today is saving lives. However, individual riflemen commonly carry in excess of 100 pounds of gear on all dismounted missions; some much more than that. Equipment weight is a constant complaint we hear about when we talk to our deployed soldiers. Not surprisingly, we also see an alarming number of muscular-skeletal non-combat injuries in our military hospitals. While we certainly support enhancing the individual soldier's capability and

protection, the price we often pay is more weight. I've often wondered if we would have taken just five percent of what was spent on the now-terminated Future Combat Systems (FCS) program and applied it to lessening the weight of what our soldiers carry, where would we be today.

I know Ranking Member Reyes shares my concern, which is why we have scheduled a specific hearing on this issue next week. Somehow we must figure out how to incentivize industry and academia to lessen the weight for the soldier.

In terms of the tactical network, I've always felt that one of the many mistakes that were made with the FCS program was that the Army should have first and foremost focused on getting the network right, instead of trying to do all of the vehicle and unmanned vehicle components of the program, simultaneously.

We understand the importance of what the Army is trying to do with the tactical network. If we are going to send a soldier into harm's way, he or she should never have to open a communications device and have it say "service not available" nor "can you hear me now?" The committee has been very critical of the lack of a network strategy over the last couple of years. It is my understanding that the Army has made a lot of progress this last year in laying out a nested network strategy. However, I am reminded of the old adage that a "vision without resources is a hallucination." We need assurances that the network is based on an open architecture, isn't dependent on proprietary designs, and that it is pursued using full and open competition.

Finally, the committee has and continues to support the Army's goal of pursuing a modernized combat vehicle. However, the committee needs to understand the rationale as to why the Ground Combat Vehicle should proceed as scheduled or if it should move to the right, in time? How do we know that the GCV is the full spectrum vehicle that the Army needs? Why did the Army not complete an analysis of alternatives before it issued the original requests for proposals as this committee had encouraged? Can the Army afford to launch another program that could cost up to $30 billion to procure a vehicle that carries a squad of nine instead of the current six? Why not consider as an alternative option, continuing to upgrade Abrams, Bradleys

and Strykers; focus on the network and take part of the funds and apply it to lightening the load of the soldier?

Ten years ago we were told that the Paladin howitzer couldn't be upgraded and that Crusader and then-Non-Line-of-Sight Cannon (N-LOWS-C) was the only solution. And now that those programs have been terminated we are pursuing an upgraded Paladin howitzer, albeit with technologies from Crusader and N-LOWS-C.

To be clear, I am not saying that I don't support the GCV program. And to be fair, I believe the Army's requirements will become clearer to the committee once the results of the Analysis of Alternatives are submitted. However, as was the case with the FCS program, it is this committee's responsibility to ask the hard questions now, so that we don't learn in five years that the Army can't afford the GCV or that it is based on "exquisite" requirements.

Statement of the Honorable Silvestre Reyes
Ranking Member, Subcommittee on Tactical Air and Land Forces
Army Modernization

March 9, 2011

- Today's hearing on Army Modernization comes at a critical time for the Army.

- The Army has been at war for almost 10 years – the longest continual period of combat for the US Army since the war in Vietnam, and the longest war ever for an all-volunteer Army.

- Like all wars, these wars have changed the Army in profound ways, and in ways not predicted.

- The Army of today features soldiers operating from widely dispersed fixed locations and in relatively small elements – usually a company or below – instead of the constantly moving large formations the Army practiced to fight in for decades.

- The Army of today integrates unmanned systems, intelligence networks, biometrics, and communications networks in a way

unforeseen before September 11, 2001, when the term "IED" was not even in the Army's lexicon.

- At the same time, today's Army leadership faces the same dilemma faced by their predecessors.

- Namely, answering two critical questions:

- First, what kind of missions must the Army prepare to perform?

- And second, how to equip the Army of today while preparing the Army of tomorrow?

- Today's hearing will center on finding that critical balance point on those two questions.

- The Fiscal Year 2012 Army budget request for modernization is commendable in many ways.

- For the first time in many years, the Army has a single modernization strategy that is integrated and resourced, and that covers the five key aspects of equipping the force:

- Soldier Equipment and Weapons
- Communications, Intelligence, and Network equipment
- Aviation and UAVs
- Armored combat vehicles
- Wheeled combat vehicles

- A great deal of the credit for this clear and integrated approach lies with the Vice Chief of Staff, General Chiarelli, who is here today to testify.

- While he has not yet fixed every problem in Army modernization, his efforts and hard work have put the Army in a much stronger position to justify and protect its modernization efforts, both in the Pentagon and here in Congress.

- When Secretary Gates testified before the committee in February, he said that "because the future is so uncertain, procurement funds must be focused on those areas that are useful in many possible operations", not just a narrow range.

- In my view, the Army's 2012 budget request does that in most areas.

- It invests heavily in modernizing and expanding the Army's aviation capability and network communications – both areas essential for today's fight in Afghanistan and that the Army will be able to use in the future no matter what kind of operations it conducts.

- Significant funds are also requested for upgrades to soldier personal equipment intended to improve lethality and protection while reducing weight – another area where the Army will benefit regardless of what the future holds.

- In this request the Army also continues to aggressively modernize its fleet of wheeled vehicles, from MRAPs to trucks to humvees.

- Finally, in terms of armored vehicles, the request makes what were probably the most difficult judgment calls.

- The request clearly focuses on the future, with heavy investment in the Ground Combat Vehicle program.

- In order to achieve this focus on the future, the request does show a significant drop across the board in ongoing upgrades for current vehicles.

- In three major cases – Abrams tanks, Bradley fighting vehicles, and Stryker vehicles, the Army has chosen to accept the risk of production shutdowns in the 2013-2016 timeframe, as the Army waits to produce upgraded versions of these vehicles at the end of the decade.

- These shutdowns will present significant challenges to the Army and the defense industrial base, so I look forward to hearing more today about how the Army will mitigate the risks involved with this plan.

- However, despite this and other challenges, the Army modernization budget request for 2012 represents a solid plan for the future that seeks to balance the needs of today with the needs of tomorrow.

- While the subcommittee will carefully review this plan, I think the Army is starting from a position of strength in large part due to

the hard work over the past year from the three men sitting at the witness table: General Chiarelli, Lieutenant General Lennox, and Lieutenant General Phillips.

- I look forward today in hearing more detail about the budget request.

RECORD VERSION

STATEMENT BY

GENERAL PETER W. CHIARELLI
VICE CHIEF OF STAFF
UNITED STATES ARMY

BEFORE THE
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES
COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES

FIRST SESSION, 112TH CONGRESS

ON ARMY ACQUISITION AND MODERNIZATION

MARCH 9, 2011

NOT FOR PUBLICATION
UNTIL RELEASED BY THE
COMMITTEE ON ARMED SERVICES

Introduction

Chairman Bartlett, Congressman Reyes, distinguished Members of the Subcommittee on Air and Land Forces, I thank you for this opportunity to discuss the Fiscal Year 2012 (FY12) budget request as it pertains to Army Acquisition and Modernization. I am pleased to represent U.S. Army leadership, members of the Army Acquisition workforce, and the more than one million courageous men and women in uniform who have deployed to combat over the past nine-plus years, and who have relied on us to provide them with world-class weapon systems and equipment to ensure mission success. On behalf of our Secretary, the Honorable John McHugh and our Chief of Staff, General George Casey, I would like to take this opportunity to thank the members of this committee for your steadfast support and shared commitment in this endeavor.

Overview of Army Modernization

America's Army continues to face a broad array of complex challenges as the Nation approaches the start of the second decade of a long-term struggle against a global extremist network. The Army's responsibility remains dual-focused: we must achieve success in Iraq and Afghanistan, while also ensuring we are prepared for unexpected contingencies or future national security challenges across the full spectrum of operations. Recognizing that this era of persistent conflict, as it is characterized by General Casey, may very well require frequent and continuous commitment by the United States Army and our sister services.

For the latter half of the last century, the United States Army faced a relatively certain future characterized by straightforward strategic and operational environments; obvious enemies; clearly identifiable threats to

vital national interests; and adequate resources required to man and equip the Force. Under these circumstances, a tiered readiness approach and an equipping strategy that made large purchasing commitments based on long-range goals made sense. Today's uncertain, dynamic strategic and operational environments, current political and fiscal realities, and the rapid pace of technology development have made these Cold War-era strategies no longer supportable.

We recognize the Army's strategy to equip the force in the 21st century must change to meet the challenges of this new strategic, operational, and fiscal environment. No longer can the Army pursue a transformational equipping strategy focused on "game-changing", "leap-ahead" technologies intended to revolutionize military operations and create conditions that force opponents to fight the way we want them to fight as we did at the turn of the century. To be successful in current and future environments, we require a 21st century strategy that takes a balanced and affordable approach to equipping our Force. This strategy, aligned with the Army Force Generation (ARFORGEN) model, will allow us to improve or maintain core capabilities; incrementally modernize to deliver new and improved capabilities; and integrate portfolios to align our equipment modernization communities, thereby enabling us to develop and field a versatile and affordable mix of equipment to allow Soldiers and units to succeed in full spectrum operations today and tomorrow to maintain our decisive advantage over any enemy we face.

ARFORGEN Equipping

ARFORGEN Equipping synchronizes the distribution of equipment to units in accordance with the ARFORGEN model. It focuses on providing capabilities required for anticipated missions to Soldiers in sufficient time and in sufficient quantities to enable them to prepare for

those missions. ARFORGEN equipping allows us to tailor capabilities and resources to relatively certain near-term mission requirements without committing to extended production runs or maintenance programs for equipment that may be outdated or no longer relevant in future increments.

Incremental Modernization

Incremental Modernization enables us to deliver new and improved capabilities to the Force by leveraging mature technologies, shortening development times, planning growth potential, and integrating increments of those capabilities to give us the greatest advantage in the future while hedging against uncertainty. Incremental modernization does not neglect existing equipment. In addition to expanding or improving capability by developing and fielding new technologies, the Army will continue to upgrade, improve, and recapitalize existing capabilities while simultaneously divesting those capabilities deemed redundant or no longer required. By modernizing in an incremental manner, instead of purchasing equipment in quantities large enough to equip the entire force, the Army is able to provide the most relevant versions of capabilities available to units prior to deployment; then equip subsequent units in the "Equip" and "Train/Ready" phases of ARFORGEN with newer and more relevant versions based on the capability provided and cost.

Integrated Portfolios

Integrated Portfolios, which the Army is still developing, will better align equipping stakeholders to achieve balance within and across capabilities required to execute the Army's Operating Concept. Equipment portfolios support continuous assessment across capability development, requirements, resourcing, acquisition, distribution, use, and

divestiture. Each portfolio will have a strategy developed to provide context, outline objectives, methods, metrics and values against which to judge success, a description of required resources to execute the strategy over the life of the program, and a discussion of risk including operational impacts if portfolio capabilities are not met. Implementing these strategies will enable portfolio stakeholders to better assess current and proposed capabilities against requirements; fuse and align the modernization community to ensure integration across the separate requirements, acquisition, sustainment, and resourcing communities; and do so in an affordable manner. Continued Army examination and adjustment of our business processes will help us to meet equipping balance and affordability requirements.

The 2010 Army Modernization Strategy (AMS), published in April 2010, matched our overall modernization strategy to our strategic requirements. It described the ways and means to develop and field a versatile and affordable mix of the best equipment available to better enable Soldiers to succeed in current and future operational environments. As evolved, the Army Modernization Plan 2012 (ModPlan12) envisions action along four lines of effort:

- **Modernize:** Develop and acquire new equipment or improve / upgrade existing equipment to meet identified capability gaps and to maintain dominance in core capabilities.
- **Sustain:** Extend the useful life of existing equipment to close or avoid creating capability gaps through another ARFORGEN cycle and by divesting equipment providing little value.
- **Mitigate:** Procure mission-specific equipment for immediate capability needs.
- **Field:** Provide equipment to Soldiers and units in accordance with Army priorities and the ARFORGEN model to enable training, preparation, and employment for mission success.

The Army Modernization Plan 2012 (ModPlan12), which we anticipate being published in March of this year, supports the submission of the President's Budget Request for FY12 Research, Development, and Acquisition (RDA) funds and presents an overview of the Army's broader modernization strategy. The ModPlan12 incorporates lessons learned from almost a decade of conflict and provides details of what is required for developing, fielding and sustaining equipment in an affordable, incremental manner to ensure our Soldiers and units have the capabilities they need to be successful across the full-range of military operations today and into the future.

As our Nation continues to work its way back from a serious economic downturn and military spending faces greater scrutiny and constraint, the Army continues our ongoing efforts to restore balance to the Force, while not losing the momentum gained over the past decade. Recognizing that to do this the Army must change the way it develops and delivers the capabilities required to both win current wars while simultaneously preparing for future contingencies.
The Army is better equipped now than ever before; and, we must maintain our combat edge while we work to reconstitute and rebalance the Force, recognizing that even after the eventual drawdown of Forces in Iraq and Afghanistan the Army's long-standing National Security Requirements will remain.

For nearly a decade, the Army has been operating at a tremendous and persistent pace. The demand for forces stressed our supply during most of this period. The result was an Army out of balance, fully committed with little strategic flexibility to respond to other contingencies. The Army is seeing significant progress in our efforts to re-balance the Force, and with the continued support of Congress, we are funded to

largely meet our goals by the end of FY12. We have done this through successful implementation of a four-year plan centered on our imperatives. We continue to prepare forces for success in the current conflicts; reset returning units; and transform the Army, adapting to meet the demands of the second decade of the 21st century.

Capability Portfolio Review Process

We're all aware of the significant challenges we're facing in light of current fiscal constraints. We recognize we must reform our budget practices and assumptions and gain efficiencies wherever possible. And, I'm confident we're on the right path to do so.

Last February, Secretary of the Army McHugh directed the Under Secretary of the Army, Dr. Joseph Westphal and the VCSA to implement a Capability Portfolio Review (CPR) process for a one-year period. Our goal in conducting these reviews is twofold: first, to ensure that funds are programmed, budgeted and executed against validated requirements and cost- and risk-informed alternatives, with the near term objective to inform POM 13-17; secondly, we want to revalidate portfolios through an examination of Combatant Commanders operational needs, wartime lessons learned, the Army Force Generation model, emerging technologies, affordability, interest, and opportunity.

Through the CPR process, in less than a year, we've identified a number of areas where we're able to make changes and eliminate redundancies or outdated requirements. In fact, as part of the Department of Defense's reform agenda, the Army has proposed $29 billion in savings over the next five years. The Army, per Secretary Gates' directive, will be allowed to reinvest this money in high priority capabilities and programs.

Army Priority Programs for Modernization

The Army has prioritized its materiel programs to focus on capabilities which give our Soldiers and units the decisive edge in full spectrum operations. While considering program cost and size, the emphasis is on capabilities critical to Army success and our ability to Network the Force; Deter and Defeat Hybrid Threats; and Protect and Empower Soldiers.

This next section outlines the Army's critical FY12 Priority Programs, providing an overview of the capability each program will provide our Soldiers, as well as a current programmatic status.

The Network

The Network represents the centerpiece of Army Modernization. Ultimately, it will connect Leaders and Soldiers at all levels, at every echelon of command, in any formation, and across the entire team—with the right information quickly and seamlessly. In doing so, it will make our various formations more lethal, faster, and survivable. It will literally redefine how we fight.

To work effectively, the Network must be a single, affordable, cost-effective network that will allow any system or application – whether developed by the Army, our Sister Services, Allies, or some other agency – to 'plug and play' using a common operating environment that ensures the systems and applications are interoperable and user-friendly from the start.

Today, the Army is past talking concepts. We are making the Network happen, delivering needed capability downrange as we speak. That said, there is still much to be done. In particular, we are very focused

on doing everything we can to get more network capability into theater—faster. And, the key to doing so is leveraging mature commercial technologies through integrated network 'capability sets' aligned against the ARFORGEN model. Instead of buying the full acquisition objective upfront, the incremental modernization strategy will enable the Army to purchase an initial 'capability set' and then subsequent sets every two years that reflect changes in technology.

Joint Tactical Radio System (JTRS)

JTRS is the Services' future deployable mobile communications family of radios. Its primary components are a Wideband Data Radio, Handheld Manpack Small Form Fit (HMS) Manpack (MP) and Rifleman Radio. JTRS uses Internet Protocol-based technology to provide network routing; embedded information assurance; and, with multiple channels, provide simultaneous exchange of voice, data, and video. The Wideband Data Radio component supports legacy waveforms (Single Channel Ground and Airborne Radio System (SINCGARS), Enhanced Position Location Reporting System (EPLRS), Ultra-High Frequency Satellite Communications (UHF SATCOM) and High Frequency (HF)) for backward compatibility with current force radios and leverages the Wideband Networking Waveform (WNW) and Soldier Radio Waveform (SRW) to meet tactical networking requirements.

HMS Man Pack and Rifleman Radio are the primary JTRS capability for battalion and below tactical operations. Both support the SRW waveform capability. HMS MP is a two-channel multiband, multimode communications system that supports not only SRW, but interoperates with legacy waveforms as part of its Increment 1 delivery (SINCGARS, UHF SATCOM). The Rifleman Radio is the dismounted Soldier capability that utilizes the SRW waveform to connect the Soldier to

the Leader. The system provides voice and individual location information, primarily serves the maneuver team formation, and provides a complimentary capability to the Nett Warrior-enabled Leader.

Warfighter Information Network-Tactical (WIN-T) Increment 1 and 2

WIN-T provides the broadband backbone communications for the tactical Army. WIN-T Increment 1 (formerly Joint Network Node) began fielding in 2004 to provide a satellite based Internet Protocol (IP) network down to battalion level. WIN-T Increment 2 begins fielding in FY12 to provide an initial On the Move (OTM) capability, extending down to company level for 65 select units, with larger throughput to battalion, brigade and division headquarters. WIN-T Increment 1 fields to 31 units in FY11 and the remaining 25 units in FY12. Increment 1 continues to upgrade the fleet to Ka band, exploiting the Wideband Global Satellite constellation rather than leased Ku band. Upgrades to Increment 1b occur in FY11-16 for interoperability with later WIN-T increment and strategic networks. WIN-T Increment 2 procures 8 BCTs/1 Division HQ and the training base in FY11 and upgrades 3 Fixed Regional Hub nodes to complete LRIP as it prepares for IOTE in FY12. Procurement of 9 BCTs/2 Division HQs is planned for FY12. Plans are being further refined to cascade WIN-T Increment 1 equipment, displaced by WIN-T Increment 2 fielding, to meet emerging requirements, including Homeland Security missions, force structure changes, and requirements not addressed in the initial procurement. WIN-T Increment 1 is post Milestone C. Full rate production status decision is pending Beyond Low Rate Initial Production (LRIP) report and Information Support Plan, followed by a Defense Acquisition Executive (DAE) decision. WIN-T Increment 2 reached Milestone C in Feb 2010, and goes to Initial Operational test and Evaluation (IOTE) in 3QFY11.

Joint Battle Command-Platforms (JBC-P)

JBC-P is a foundation for achieving information interoperability between Joint warfighting elements on current and future battlefields. As the next generation of Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT) technology, it will be the principal command and control system for the Army and Marine Corps at the brigade-and-below level, providing users access to the tactical information necessary to achieve information dominance on the battlefield. JBC-P consists of computer hardware and software integrated into tactical vehicles, aircraft, and provided to dismounted forces. The capability uses a product line approach to software development to save cost and promote a common architecture. Components include a core software module that provides common functionality required of all platforms and tailored software modules with unique capabilities for dismounted, vehicle, logistics, aviation, and command post elements. JBC-P software is designed for use over the Blue Force Tracking II transceiver and associated satellite networks, as well as ground-based networks. The new transceiver allows for a tenfold increase in data throughput. Other key enhancements include a redesigned, intuitive user interface and faster mapping software to quickly process and display critical graphics. It will be the primary provider and user of digital battle command and situational awareness across the spectrum of operations and will allow warfighters to more effectively and consistently communicate critical information over networks that connect the most distant and remote locations.

Distributed Common Ground System-Army (DCGS-A)

DCGS-A is the Army's component of the DoD Distributed Common Ground/Surface System family of systems. DCGS-A provides commanders from tactical company-level to Army Service Component

Command (ASCC)-level access to the Defense Intelligence Information Enterprise, and the tools required to leverage the entire National, Joint, Tactical, and Coalition Intelligence, Surveillance, and Reconnaissance (ISR) community to satisfy their information requirements. The Army is currently revising the DCGS-A acquisition strategy to comply with DoD's revised Information Technology Acquisition Process. This will ensure the program continues to develop enhanced analytic capabilities by exploiting emerging technologies and fielding these capabilities to the Force IAW the ARFORGEN process. The Army has incrementally fielded DCGS-A capabilities to deploying forces beginning in 2006. The program will reach Initial Operating Capability with the Army's first "cloud" architecture in Afghanistan in March 2011 and the Full Deployment Decision in 2QFY12.

Enhanced – Infantry Brigade Combat Team Increment 1 (E-IBCT)

The E-IBCT program was developed as an effort to accelerate iterative fielding of key network and sensor capabilities. Following an in-depth assessment of the E-IBCT program, the Army decided to continue Low-Rate Initial Production of two elements: the Small Unmanned Ground Vehicle (SUGV) and Network Integration Kit (NIK), and will transition the procurement of these systems to the respective Program Executive Offices. E-IBCT will be concluded as a program of record at the end of Low Rate Initial Production, a decision that carefully balances military utility, system performance, and affordability with the immediate needs of our warfighters. Phasing out the E-IBCT program supports the Army effort to collapse redundant and competing network strategies into a single path forward with programs of record that provide more capability, quicker, and to more formations. E-IBCT investment provided the infrastructure that will enable the Army to grow the tactical network capability, while providing an opportunity for both large and small scale industry to support the Army's tactical network strategy. The NIK is a necessary bridge solution

allowing the Army to continue evaluation and development of incorporated network technologies. Fielding of an additional brigade of NIK vehicles will allow the Army to continue to evaluate BCT communications capabilities and solutions. The E-IBCT program derived valuable information from warfighter evaluations regarding what network capabilities Soldiers need and how they will be used in today's dynamic, evolving combat environment. The Army will retain a fully operational brigade, located at Fort Bliss, Texas, with the mission of validating the operational relevancy of solutions and developing doctrine prior to fielding technologies to deploying forces to ensure proven capabilities reach the hands of our Soldiers.

Our path forward supports fielding of a robust networking capability package to Afghanistan in Fiscal Year 2013. For the time being we are focused on replicating the deployed network and troubleshooting integration issues as we continue to fill capability gaps in theater with Commercial Off the Shelf or "COTS" systems and ISR capabilities.

While the Network represents the bedrock of Army modernization; the reality is much of what we are trying to accomplish, in terms of improving the pace of Army acquisition to leverage both military development and private sector technologies, has application across the entire modernization program.

Ground Combat Vehicle

The Army's Combat Vehicle Modernization Strategy represents a holistic approach to the development of the Ground Combat Vehicle (GCV); replacement of the M113 Family of Vehicles; and the incremental modernization of the Bradley, Abrams, Paladin, and Stryker. Modernization imperatives across the fleet include improved protection,

mobility and sustainment, mitigation of existing Space, Weight and Power (SWaP) shortfalls and Network integration. The Army re-released the Request for Proposals (RFP) for the GCV on 30 November. The RFP focuses on the "Big 4" imperatives: Soldier protection; Soldier capacity (squad plus crew); Full Spectrum; and Timing (7 years to first production vehicle). Modular armor will allow commanders the option to add or adjust vehicle protection armor based on the threat environment. The GCV will be designed with the capacity for SWaP growth to incorporate future technologies as they mature. Industry proposals were received back on 21 January 2011, and we anticipate contract awards in 3QFY11.

Stryker (Double-V Hull)

In January 2010, in response to an Operational Needs Statement (ONS), the Army decided to pull forward the Double-V-Hull (DVH) existing technology from the Stryker Modernization program to increase the Stryker's underbelly protection from Improvised Explosive Devices. To meet the goal of providing 150 Stryker DVHs in Afghanistan by June 2011, the Army is conducting concurrent testing and production. Live fire data from December 2010 testing, as well as initial Reliability, Availability and Maintainability (RAM) testing data, informed a 2 March 2011 Configuration Steering Board (CSB) that recommended to keep the initiative moving forward. While we are currently engaged in producing 450 DVH to support combat operations in Afghanistan, the Army has not made a decision regarding incorporating the DVH into future Stryker production, and we have just begun to assess the potential to retrofit DVH onto existing Stryker vehicles.

Paladin Integrated Management (PIM)

PIM is the Army's fire support modernization effort for the Paladin and Field Artillery Ammunition Supply Vehicle (FAASV) platforms to

address obsolescence and sustainment through the integration of Bradley and Future Combat Systems (FCS) common components resulting in an upgraded firing platform. PIM replaces the current M109A6 Paladin and M992A2 FAASV with a more robust platform incorporating Bradley common drive train and suspension components. Due to the Secretary of Defense's decision to cancel the FCS Manned Ground Vehicle's Non-Line of Sight-Cannon, the PIM program is now a priority modernization effort. The program has completed contractor testing at Government facilities, and is expected to be designated as an Acquisition Category I Major Defense Acquisition Program.

Kiowa Warrior (KW)

The Army requires a next generation capability to satisfy its armed aerial scout attack, reconnaissance and security mission requirements within the current and future combat environments. In April of 2009, the Secretary of the Army approved a strategy to reinvest in the OH-58D KW helicopter to address obsolescence and sustainment until a viable replacement is procured. The fully funded Cockpit And Sensor Upgrade Program (CASUP) addresses system and armament obsolescence, aircrew survivability and overall aircraft weight to improve the helicopter's performance and update its Aircraft Mission-Design Series (MDS) to OH-58F. The CASUP is not a Service Life Extension Program (SLEP) and does not zero time the airframes. First Unit Equipped for the OH-58F KW helicopter is forecasted for FY15. The CASUP is post-Milestone B, and has entered the Engineering and Manufacturing Development (EMD) phase of the program. Additionally, the Armed Aerial Scout is undergoing its Analysis of Alternatives (AoA). Emerging study results are scheduled for completion in February 2011, with the final Senior Advisory Group briefing to OSD to follow. The Armed Aerial Scout AoA Study Report is expected in April 2011.

Closing

In support of Army Acquisition and Modernization, the Army has submitted a Research, Development and Acquisition budget request of $31.8B for FY12. We believe the proposed budget allocates resources appropriately between fielding advanced technologies in support of Soldiers currently in the fight and developing new technologies for the future. We are confident it will enable us to meet our intent to develop, field and sustain equipment in an affordable, incremental manner to ensure our Soldiers and units have the capabilities they need to succeed across the full spectrum of operations in this era of persistent conflict.

These continue to be challenging times for our Nation and for our military. That said, I assure the members of this committee – your Army's senior leaders remain focused and working hard to address current challenges, while determining the needs of the Force for the future.

Mr. Chairman, members of the subcommittee, I thank you again for your steadfast and generous support of the outstanding men and women of the United States Army, Army Civilians and their Families. I look forward to your questions.

United States Army

General Peter W. Chiarelli

Vice Chief of Staff
United States Army
200 Army Pentagon
Washington,DC20310-0200
Since: Aug 2008

SOURCE OF COMMISSIONED SERVICE ROTC

EDUCATIONAL DEGREES
Seattle University – BS – Political Science
University of Washington – MPA – International Relations and Economics
United States Naval War College – MA – National Security and Strategic Studies
United States Army Command and General Staff College – MA – Military Art and Science

MILITARY SCHOOLS ATTENDED
Armor Officer Basic Course
Infantry Officer Advanced Course
National War College
United States Naval Command and Staff College

FOREIGN LANGUAGES None recorded

PROMOTIONS	DATE OF APPOINTMENT
2LT	21 Sep 72
1LT	21 Sep 74
CPT	21 Sep 76
MAJ	1 Mar 84
LTC	1 Mar 90
COL	1 Jun 95
BG	1 Sep 99
MG	1 Jan 03
LTG	22 Nov 05
GEN	4 Aug 08

FROM	TO	ASSIGNMENT
Mar 73	Jun 75	Platoon Leader, later Executive Officer, Headquarters and Headquarters Troop, 3d Squadron (Air), 5th Cavalry, 9th Infantry Division, Fort Lewis, Washington
Jun 75	Dec 77	S-2 (Intelligence), later Commander, A Troop, 3d Squadron, 5th Cavalry, 9th Infantry Division, Fort Lewis, Washington
Jan 78	Jul 78	Student, Infantry Officer Advanced Course, United States Army Infantry School, Fort Benning, Georgia
Aug 78	Jun 80	Student, University of Washington, Seattle, Washington
Jun 80	Jun 84	Instructor, later Assistant Professor, United States Military Academy, West Point, New York
Jul 84	Jun 85	Student, United States Naval Command and Staff College, Newport, Rhode Island
Jun 85	Oct 87	S-3 (Operations), 3d Battalion, 33d Armor, 3d Armored Division, United States Army Europe and Seventh Army, Germany
Oct 87	Jun 89	S-3 (Operations), 2d Brigade, 3d Armored Division, United States Army Europe and Seventh Army, Germany
Jul 89	Jun 90	Assistant Operations Officer, G-3 (Operations), I Corps, Fort Lewis, Washington
Jun 90	Aug 92	Commander, 2d Battalion, 1st Infantry, 9th Infantry Division, Fort Lewis, Washington
Aug 92	Jun 93	Student, National War College, Fort Lesley J. McNair, Washington, DC
Jun 93	May 95	G-3 (Operations), 1st Cavalry Division, Fort Hood, Texas
May 95	Apr 96	Deputy G-3 (Operations) and Director for Plans, Training and Mobilization, III Corps, Fort Hood, Texas

GEN Peter W. Chiarelli

May 96	Jul 98	Commander, 3d Brigade, 2d Infantry Division, Fort Lewis, Washington
Aug 98	Jul 00	Executive Assistant, later Executive Officer to the Supreme Allied Commander Europe, Supreme Headquarters Allied Powers Europe, Belgium
Aug 00	Aug 01	Assistant Division Commander (Support), 1st Cavalry Division, Fort Hood, Texas
Aug 01	Jul 03	Director of Operations, Readiness and Mobilization, Office of the Deputy Chief of Staff, G-3, United States Army, Washington, DC
Aug 03	Nov 05	Commanding General, 1st Cavalry Division, Fort Hood, Texas and OPERATION IRAQI FREEDOM, Iraq
Jan 06	Dec 06	Commander, Multi-National Corps-Iraq, OPERATION IRAQI FREEDOM, Iraq
Jan 07	Mar 07	Special Assistant to the Commander, United States Central Command for the Development of Regional Military Capability, Washington, DC (No Joint Credit)
Mar 07	Aug 08	Senior Military Assistant to the Secretary of Defense, Office of the Secretary of Defense, Washington, DC
Aug 08	Present	Vice Chief of Staff, United States Army, Washington, DC

SUMMARY OF JOINT ASSIGNMENTS	DATE	GRADE
Executive Assistant, later Executive Officer to the Supreme Allied Commander Europe, Supreme Headquarters Allied Powers Europe, Belgium	Aug 98-Jul 00	Colonel/Brigadier General
Commander, Multi-National Corps-Iraq, OPERATION IRAQI FREEDOM, Iraq	Jan 06-Dec 06	Lieutenant General
Special Assistant to the Commander, United States Central Command for the Development of Regional Military Capability, Washington, DC	Jan 07-Present	Lieutenant General
Senior Military Assistant to the Secretary of Defense, Office of the Secretary of Defense, Washington, DC	Mar 07-Aug 08	Lieutenant General

SUMMARY OF OPERATIONS ASSIGNMENTS	DATE	GRADE
Commanding General, 1st Cavalry Division, OPERATION IRAQI FREEDOM, Iraq	Mar 04-Feb 05	Major General
Commander, Multi-National Corps-Iraq, OPERATION IRAQI FREEDOM, Iraq	Jan 06-Dec 06	Lieutenant General

US DECORATIONS AND BADGES

Defense Distinguished Service Medal (with 2 Oak Leaf Clusters)
Distinguished Service Medal
Legion of Merit (with 2 Oak Leaf Clusters)
Bronze Star Medal
Defense Meritorious Service Medal
Meritorious Service Medal (with 4 Oak Leaf Clusters)
Army Achievement Medal (with Oak Leaf Cluster)
Combat Action Badge
Office of the Secretary of Defense Identification Badge
Army Staff Identification Badge

United States Army

Lieutenant General Robert P. Lennox

Deputy Chief of Staff, G-8
United States Army
700 Army Pentagon
Washington,DC20310-0700
Since: Nov 2009

SOURCE OF COMMISSIONED SERVICE USMA

EDUCATIONAL DEGREES
United States Military Academy – BS – No Major
Stanford University – MBA – Business Administration
National Defense University – MS – National Security and Strategic Studies

MILITARY SCHOOLS ATTENDED
Air Defense Artillery Officer Basic and Advanced Courses
National War College
United States Army Command and General Staff College

FOREIGN LANGUAGES None recorded

PROMOTIONS	DATE OF APPOINTMENT
2LT	8 Jun 77
1LT	8 Jun 79
CPT	4 Apr 81
MAJ	1 Apr 88
LTC	1 Sep 92
COL	1 May 98
BG	1 Feb 03
MG	19 Jul 06
LTG	2 Nov 09

FROM	TO	ASSIGNMENT
Nov 77	Oct 80	Platoon Leader, B Battery, later Executive Officer, C Battery, later S-1 (Adjutant), 1st Battalion, 62d Air Defense Artillery, 25th Infantry Division, Schofield Barracks, Hawaii
Nov 80	Jun 81	Student, Air Defense Artillery Officer Advanced Course, Army Air Defense School, Fort Bliss, Texas
Jun 81	Jun 82	S-1 (Adjutant), 1st Battalion, 67th Air Defense Artillery, Fort Lewis, Washington
Jun 82	Dec 83	Commander, C Battery, 1st Battalion, 67th Air Defense Artillery, Fort Lewis, Washington
Mar 84	Jun 84	Assistant Division Air Defense Officer, 9th Infantry Division, Fort Lewis, Washington
Jun 84	Aug 85	S-3 (Operations), 1st Battalion, 67th Air Defense Artillery, Fort Lewis, Washington
Sep 85	Jun 87	Student, Stanford University Graduate School of Business, Stanford, California
Jun 87	Jul 90	Instructor/Course Director, later Assistant Professor, later Associate Professor, Department of Social Sciences, United States Military Academy, West Point, New York
Aug 90	Jun 91	Student, United States Army Command and General Staff College, Fort Leavenworth, Kansas
Jun 91	May 92	Executive Officer, 4th Battalion, 43d Air Defense Artillery, 32d Army Air Defense Command, United States Army Europe and Seventh Army, Germany and OPERATION DETERMINED RESOLVE, Saudi Arabia
May 92	May 93	Chief, G-3 (Plans and Exercises), 32d Army Air Defense Artillery Command, United States Army Europe and Seventh Army, Germany
May 93	Jun 95	Commander, 1st Battalion, 2d Air Defense Artillery, 108th Air Defense Artillery Brigade, Fort Polk, Louisiana
Jun 95	Jun 96	Student, National War College, Fort Lesley J. McNair, Washington, DC

LTG Robert P. Lennox

Jun 96	Apr 98	Missile Defense Planner, Sea, Air and Space Superiority Assessment Division, J-8, The Joint Staff, Washington, DC
Apr 98	Apr 00	Commander, 108th Air Defense Artillery Brigade, Fort Bliss, Texas
Apr 00	Jul 01	Director, Army Staff Transition Coordination Team, Office of the Chief of Staff, Army, Washington, DC
Jul 01	Jun 03	Deputy Commanding General, United States Army Air Defense Artillery Center and Fort Bliss, Fort Bliss, Texas
Jun 03	Jun 04	Deputy Commanding General, United States Army Space Command/Deputy Commanding General for Operations, United States Army Space and Missile Defense Command, Peterson Air Force Base, Colorado
Jul 04	Jun 05	Deputy Commanding General/Chief of Staff, United States Army Accessions Command, Fort Monroe, Virginia
Jun 05	Jan 08	Commanding General, United States Army Air Defense Artillery Center and Fort Bliss, Fort Bliss, Texas
Jan 08	May 09	Assistant Deputy Chief of Staff, G-3/5/7, United States Army, Washington, DC
May 09	Nov 09	Director, Quadrennial Defense Review, Office of the Deputy Chief of Staff, G-8 United States Army, Washington, DC
Nov 09	Present	Deputy Chief of Staff, G-8, United States Army, Washington, DC

SUMMARY OF JOINT ASSIGNMENTS	DATE	GRADE
Missile Defense Planner, Sea, Air and Space Superiority Assessment Division, J-8, The Joint Staff, Washington, DC	Jun 96-Apr 98	Lieutenant Colonel

SUMMARY OF OPERATIONS ASSIGNMENTS	DATE	GRADE
Executive Officer, 4th Battalion, 43d Air Defense Artillery, 32d Army Air Defense Command, United States Army Europe and Seventh Army, Germany and OPERATION DETERMINED RESOLVE, Saudi Arabia	Jun 91-May 92	Major

US DECORATIONS AND BADGES

Distinguished Service Medal (with Oak Leaf Cluster)
Legion of Merit (with 4 Oak Leaf Clusters)
Defense Meritorious Service Medal
Meritorious Service Medal (with 5 Oak Leaf Clusters)
Joint Service Commendation Medal
Army Commendation Medal
Army Achievement Medal (with Oak Leaf Cluster)
Parachutist Badge
Senior Air Force Space and Missile Badge
Senior Air Force Space Badge
Air Force Space Badge
Joint Chiefs of Staff Identification Badge
Army Staff Identification Badge

United States Army

Lieutenant General William N. Phillips

Military Deputy/Director, Army Acquisition Corps
Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology)
103 Army Pentagon
Washington,DC20310-0103
Since: Jan 2010

SOURCE OF COMMISSIONED SERVICE ROTC

EDUCATIONAL DEGREES
Middle Tennessee State University – BS – Animal Science
Troy State University – MS – Personnel Management/Administration
Webster University – MA – Procurement and Contract Management
National Defense University – MS – National Resource Strategy

MILITARY SCHOOLS ATTENDED
Field Artillery Officer Basic and Advanced Courses
Industrial College of the Armed Forces
United States Army Command and General Staff College

FOREIGN LANGUAGES None recorded

PROMOTIONS	DATE OF APPOINTMENT
2LT	1 Jul 76
1LT	1 Jul 78
CPT	16 Aug 80
MAJ	1 Nov 87
LTC	1 May 93
COL	1 Feb 99
BG	1 Jan 05
MG	28 Oct 09
LTG	31 Jan 10

FROM	TO	ASSIGNMENT
Nov 76	Oct 78	Assistant Executive Officer, later Executive Officer, C Battery, 3d Battalion, 18th Field Artillery, Fort Sill, Oklahoma
Nov 78	Aug 79	Student, Officer Rotary Wing Aviator Course, United States Army Aviation Center, Fort Rucker, Alabama
Aug 79	Sep 82	Section Leader, 118th Aviation Company, later Platoon Leader, later Executive Officer, D Company, 25th Combat Aviation Battalion, 25th Infantry Division (Light), Schofield Barrack, Hawaii
Oct 82	May 83	Student, Field Artillery Officer Advanced Course, United States Army Field Artillery School, Fort Sill, Oklahoma
Jul 83	Aug 84	Instructional Systems Research Evaluator/Designer, United States Army Aviation Center, Fort Rucker, Alabama
Aug 84	Aug 85	Commander, Internal Instructional Systems Branch, Evaluation Division, Directorate of Evaluation and Standardization, United States Army Aviation Center, Fort Rucker, Alabama
Sep 85	Jul 86	Student, Training with Industry, AH-64 Apache Production, McDonnell Douglas Helicopter Company, Mesa, Arizona
Oct 86	Jul 90	Procurement Officer, later Chief, Maintenance and Overhaul Section, later Assistant Project Manager, Procurement/Acquisition, United States Army Aviation Systems Command, Saint Louis, Missouri
Aug 90	Jun 91	Student, United States Army Command and General Staff College, Fort Leavenworth, Kansas
Jun 91	Jun 92	S-1 (Personnel), Aviation Brigade, 2d Infantry Division, Eighth United States Army, Korea

LTG William N. Phillips

Sep 92	Jun 94	Flight Operations Officer, later Chief, Flight Operations, Defense Plant Representative Office, Boeing Helicopters, Philadelphia, Pennsylvania
Jul 94	Jun 96	Commander, Defense Plant Representative Office, McDonnell Douglas, Huntington Beach, California
Aug 96	Jun 97	Student, Industrial College of the Armed Forces, Fort Leslie J. McNair, Virginia
Jun 97	May 99	Director, Information Management and Assessment, Assistant Secretary of the Army (Research, Development, and Acquisition), Washington, DC
Aug 99	Jun 01	Commander, Defense Contract Management, Defense Contract Management Agency, San Francisco, Sunnyvale, CA
Jun 01	Aug 04	Chief, Unit Set Fielding Operations Division, later Acting Director of Integration, Office of the Deputy Chief of Staff, G-8, United States Army, Washington, DC
Sep 04	Jun 07	Deputy Program Executive Officer, Aviation, Redstone Arsenal, Alabama
Jun 07	Feb 09	Commanding General, Picatinny Arsenal/Commander, Joint Munitions and Lethality Life Cycle Management Command/Program Executive Officer, Ammunition, Picatinny Arsenal, New Jersey
Feb 09	Jan 10	Commander, Joint Contracting Command, United States Forces-Iraq, OPERATION IRAQI FREEDOM, Iraq
Jan 10	Present	Military Deputy/Director, Army Acquisition Corps, Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology), Washington, DC

SUMMARY OF JOINT ASSIGNMENTS	DATE	GRADE
Flight Operations Officer, later Chief, Flight Operations, Defense Plant Representative Office, Boeing Helicopters, Philadelphia, Pennsylvania	Sep 92-Jun 94	Major
Commander, Defense Plant Representative Office, McDonnell Douglas, Huntington Beach, California	Jul 94-Jun 96	Lieutenant Colonel
Commander, Defense Contract Management, Defense Contract Management Agency, San Francisco, Sunnyvale, CA	Aug 99-Jun 01	Colonel
Commander, Joint Contracting Command, United States Forces-Iraq, OPERATION IRAQI FREEDOM, Iraq	Feb 09-Jan 10	Brigadier General/Major General

SUMMARY OF OPERATIONS ASSIGNMENTS	DATE	GRADE
Commander, Joint Contracting Command, United States Forces-Iraq, OPERATION IRAQI FREEDOM, Iraq	Feb 09-Jan 10	Brigadier General/Major General

US DECORATIONS AND BADGES

Defense Superior Service Medal
Legion of Merit (with 3 Oak Leaf Clusters)
Bronze Star Medal
Defense Meritorious Service Medal (with Oak Leaf Cluster)
Meritorious Service Medal (with 2 Oak Leaf Clusters)
Army Commendation Medal (with 2 Oak Leaf Clusters)
Joint Service Achievement Medal
Air Assault Badge
Senior Army Aviator Badge
Army Staff Identification Badge

TESTIMONY OF

DR. J. MICHAEL GILMORE

DIRECTOR, OPERATIONAL TEST AND EVALUATION

OFFICE OF THE SECRETARY OF DEFENSE

BEFORE THE UNITED STATES HOUSE OF REPRESENTATIVES

ARMED SERVICES SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

March 9, 2011

HOUSE ARMED SERVICES
SUBCOMMITTEE ON TACTICAL
AIR AND LAND FORCES

Dr. J. Michael Gilmore
Director, Operational Test and Evaluation (DOT&E)
Office of the Secretary of Defense

Mr. Chairman, Congressman Reyes, distinguished members of the Committee, thank you for the opportunity to provide my assessment of test results for the Early Infantry Brigade Combat Team (E-IBCT) Increment 1 and the Stryker Double V-Shaped Hull (SDVH) program, as well as my assessment of past and planned future testing of Army Network programs.

E-IBCT Increment 1

My assessment of the Early Infantry Brigade Combat Team (E-IBCT) Increment 1 performance is based upon the results of Limited User Test 10 (LUT 10) conducted in September 2010, at Fort Bliss, Texas, and White Sands Missile, Range New Mexico, as well as the LUT conducted in 2009.

The performance of the E-IBCT systems during these operational tests was an important consideration affecting the decision earlier this year by the Undersecretary of Defense for Acquisition, Technology and Logistics and the Army leadership to cancel three components of the E-IBCT Increment 1 – the Class 1 Unmanned Aerial System (Class 1 UAS) and both the Urban and Tactical Unattended Ground Sensors (U-UGS and T-UGS) – and to limit procurement of the Network Integration Kit to one additional brigade set. In the case of the remaining E-IBCT component, the Small Unmanned Ground Vehicle (SUGV), an additional Low Rate Initial Production (LRIP) of two brigade sets was approved. Any future SUGV production decisions will be made under a separate Army SUGV program.

Assessment of E-IBCT Test Results

My assessment of the EIBCT systems' operational effectiveness during LUT 10 conducted last September remains essentially unchanged from my assessment following the LUT conducted in 2009, about which I testified before this committee last March. Overall, during testing in both LUT 09 and LUT 10, the E-IBCT systems, with the exception of the SUGV, demonstrated little military utility and made no significant

contribution to mission accomplishment. All of the systems tested, with the exception of the SUGV, had notable deficiencies in operational performance.

The demonstrated reliability for the E-IBCT systems in LUT 10, with the exception of the Class 1 UAS, showed significant improvement over the reliability demonstrated in LUT 09.

The remainder of this testimony describes my key findings with respect to the individual E-IBCT systems, the results of testing to date of Stryker Double V-shaped Hull, and issues associated with past and planned testing of the systems composing the Army's tactical communications network.

Network Integration Kit (NIK) There was no demonstrated military utility for the NIK's primary function of networking sensor output, consisting of still images from the E-IBCT systems, with higher tactical echelons, e.g. battalion or brigade headquarters. The still imagery collected by the E-IBCT systems often contained no useful information. When useful information was collected, it was of only local tactical interest and of fleeting tactical value and, hence, was very rarely passed across the network via the NIK.

Since the sensor information from the E-IBCT systems was of limited tactical utility above company level, the test unit predominately employed local system controllers at the platoon and company level, operating these systems unconnected to the NIK.

During LUT 10, the NIK experienced a frequent degradation in Single Channel Ground and Airborne Radio System (SINCGARS) audio volume and quality, forcing units to use legacy hand-held radios or, in some cases, runners. The NIK start- up and re-boot times were long, in excess of the 25-minute "cold-start" requirement. The complexity of NIK operating and trouble-shooting procedures limited its usefulness in supporting tactical operations.

Computer Network Operations conducted by the Army identified a number of information assurance vulnerabilities in the NIK network.

The Interoperability (IO) Kit, a laptop computer connected to the Joint Tactical Radio System Ground Mobile Radio (JTRS GMR) integrated within the NIK, was used

successfully by battalion and company command posts during LUT 10. The IO Kit enabled file transfers and "chat" over the JTRS GMR Wideband Networking Waveform across the E-IBCT NIK network.

The NIK, while showing improvement in Mean Time Between System Abort (MTBSA), still fell short of its reliability requirement. The Army states it has fixed the problems experienced during the LUT with NIK start-up and re-boot, as well as SINCGARS degradation. An operational assessment scheduled to be conducted during the summer of 2011 will hopefully provide an opportunity to verify under tactically realistic conditions that these problems have been corrected.

Small Unmanned Ground Vehicle Block 1 (SUGV)

The SUGV was the most tactically useful of the E-IBCT systems. This system provides a capability for remote investigation of potential threats, such as Improvised Explosive Devices (IED). The test unit successfully employed the SUGV in support of a range of tactical missions. It was most frequently employed during missions that involved clearing buildings or caves, or at Traffic Control Points (TCPs). Based upon the results of LUT-10, I made a number of recommendations for the Army to consider that would improve the capability of future SUGV variants. Among these was the addition of an electronic tether which would allow the user to continue to operate the SUGV when radio line-of-sight was lost.

Class I Block 0 Unmanned Aerial System The Class I UAS was most useful when employed from a static defensive position such as the company combat outpost (COP). It was less useful in offensive operations due to its weight and bulkiness. The Class 1 UAS has a loud aural signature and the unit did not use it when tactical surprise was desired. The unit showed a preference for the Raven UAS over the Class I UAS because the Raven was easier to deploy, had longer endurance, and was quieter. The Class 1 UAS fell well short of its reliability requirements, demonstrating a 3.1-hour MTBSA versus a 23-hour requirement. Unlike the other E-IBCT systems, the Class 1 UAS showed little reliability growth from LUT 09.

Tactical and Urban Unmanned Ground Sensors (T-UGS and U-UGS)
Both the T-UGS and U-UGS demonstrated little tactical utility, providing the unit little useful tactical intelligence. Both systems are difficult to conceal and are easily identified by the enemy, precluding their usefulness as unattended sensors. Both the T-UGS and U-UGS exceeded their reliability requirements.

Lessons Learned I will briefly discuss two topics associated with the E-IBCT program that could be characterized as "lessons learned." These topics have applicability to other defense acquisition programs.

The first topic is operational requirements. All of the E-IBCT systems met or came close to meeting most of their documented requirements. The program office designed the E-IBCT systems to the specifications it was given and was largely successful in doing so. Yet, in operational testing, these systems demonstrated little useful military capability. In operational test and evaluation, our focus is necessarily on answering the question: "Is a unit's ability to accomplish its mission improved when equipped with a system?" and much less so on answering the question: "Does this system meet its system specifications?" In the case of the E-IBCT, the systems under test contributed little to improve mission accomplishment.

I attribute this lack of demonstrated military utility in large measure to the established system requirements and specifications not being descriptive of a meaningful and useful operational capability. In my view, the E-IBCT requirements document did not sufficiently link its largely technical specifications to desired operational outcomes. The requirements and specifications were necessary, but well short of sufficient, to assure military utility. This situation is not unique to the E-IBCT program. Program requirements must be operational in nature and clearly linked to a useful and measurable operational capability. Contract specifications must be both necessary and sufficient to assure operational effectiveness in combat.

The second topic I will address briefly is the continued need for programs to execute disciplined and rigorous developmental testing, particularly with regard to reliability. After the poor reliability results from the LUT conducted in 2009, the E-IBCT program executed an aggressive program of reliability growth and testing. This

effort resulted in the considerably improved reliability found in the operational test conducted in 2010. Had better developmental testing been conducted prior to the LUT-09, the significant reliability shortfalls would not have been discovered in operational testing and the limited military utility of the majority of the E-IBCT systems would have been clearly apparent sooner.

Stryker Double V-shaped Hull

The Army intends to begin deploying the Stryker Double V-Shaped Hull (SDVH) to Afghanistan in June 2011. The Army began the SDVH test program in July 2010 to confirm improved protection against improvised explosive devices while retaining other elements of the existing Stryker fleet's operational performance. The Army continues to conduct operational and live fire testing of the Stryker configurations modified with the DVH.

As part of the multi-phase SDVH live fire test program, the Army recently completed structural and prototype system-level testing of the protection provided by SDVH, as well as baseline Full-Up System-Level (FUSL) testing of the protection provided by the Stryker vehicles equipped with the modifications and survivability kits currently in use in Operation Enduring Freedom (OEF). These tests have provided the data needed to perform an initial comparative assessment of the protection provided by the SDVH relative to that of the original Strykers. Testing of the OEF-kitted Stryker vehicles demonstrates that the modifications significantly improve protection against improvised explosive devices relative to the original Strykers (which had no survivability kits) and in some cases provide protection comparable to the threshold requirements for Mine-Resistant Ambush Protected All-Terrain Vehicles (M-ATV). Testing also indicates that the SDVH provides significantly better protection to crew than OEF-kitted Strykers. In particular, the SDVH meets and in some cases exceeds M-ATV threshold requirements. The FUSL live fire testing of production-representative SDVH remains to be done. That testing, which the Army expects to complete by February 2012, will provide the additional data required to fully characterize the protection provided to crew by SDVH and its overall operational survivability against the full range of threats and across all Stryker configurations.

I approved a plan to conduct operational testing of the SDVH in two phases to assure the implications for tactical mobility of the additional 5,000 pounds of weight of the SDVH relative to OEF-kitted Strykers, both of which use the same engine, are understood. Based on the testing conducted thus far at the Yuma Proving Ground (YPG) and the National Training Center (NTC), I assess no operationally significant degradation to mobility when SDVH is employed on level rocky or soft soils. However, testing indicates there is some degradation in mobility that has not yet been observed to be tactically significant due to inadequate engine power when SDVH is operated over terrain with long steep slopes.

My assessment is that the driver's compartment of the SDVH is not suitable. Long-duration missions conducted with the SDVH at operational speeds using combat-experienced drivers on rugged Afghanistan-like terrain in Yuma reveal two problems with the driver's compartment:

- The seat release latch used to evacuate an incapacitated driver is extremely difficult to use: it took the crew twice as long to evacuate a driver from a SDVH as from an OEF-kitted Stryker.

- SDVH incorporates a redesigned driver's compartment with limited physical room that restricts driver movement and results in increased driver fatigue during long-duration missions.

I recommend the Army correct the first problem before deploying SDVH and implement changes to the vehicle's design mitigating the second problem as soon as feasible.

Army Network Testing

This summer's Integrated Network Baseline Event (INBE) is the Army's first major test event within its FY 11-12 Integrated Evaluation Schedule. The Army intends

that the INBE conduct six Limited User Tests to support Milestone C or fielding decisions for the following systems:

- Joint Tactical Radio System (JTRS) Ground Mobile Radio (GMR)
- Mounted Soldier System (MSS)
- Force XXI Battle Command Brigade and Below (FBCB2) Joint Capability Requirement (JCR)
- Early Infantry Brigade Combat Team (E-IBCT) Network Interface Kit (NIK)
- JTRS Handheld Manpack Small Form Fit (HMS) Manpack
- Spider XM7 Network Command Munition

These will be the most complex tests ever attempted of the systems currently planned to compose the Army's network.

Unfortunately, the Army has not yet determined how the individual systems composing the network will be used and interact with one another, or at what echelons and in what numbers those systems will be used; that is, it has not yet defined an integrated network architecture. The Army has also yet to develop test plans describing the conditions under which the upcoming INBE will be conducted, what data will be collected, and how those data will be analyzed. Without this information, which is already late-to-need to conduct testing this summer, there is substantial risk the INBE will produce information inadequate to support decisions to buy and field the systems listed above.

Developmental Test Key to a Successful Operational Test

My office witnessed a Limited User Test conducted in 2009 during which the Joint Tactical Radio System (JTRS) Handheld, Manpack and Small Form Factor (HMS) Rifleman Radio performed poorly due primarily to inadequate developmental testing. In February 2011, the program conducted additional testing demonstrating the problems identified in 2009 have been corrected. The program has now produced a radio that appears to be far superior in both cost and performance to the original Rifleman Radio.

The JTRS HMS Manpack radio only recently completed its first week-long government developmental test at the beginning of February. Thus, there is substantial

risk that problems will be discovered during the operational testing of the Manpack to be conducted as part of the upcoming INBE.

The JTRS Ground Mobile Radio (GMR) was unable to fix deficiencies, including hardware and software programmable waveform issues, identified in the 2010 System Integration Test prior to execution of the ongoing Field Experiment 5 (FE5). Similarly, there will be insufficient time to fix problems identified during FE5 prior to the upcoming INBE Limited User Test. JTRS HMS and GMR, like several other INBE programs, will complete developmental testing with little or no time to correct deficiencies prior to operational testing during the INBE.

Network Interface Kit (NIK) and JTRS GMR

The primary purpose of the NIK, with its component GMR radio, had been to provide the mobile, secure Internet enabling information derived from the E-IBCT sensors to be shared across numerous Army echelons of command. With the exception of the Small Unmanned Ground Vehicle, all the E-IBCT sensors have been terminated. Thus, the role of the NIK, including its component GMR, within the INBE is now, at best, ambiguous. This ambiguity must be resolved quickly if useful information is to be collected during the INBE regarding the contributions of the NIK [GMR] to accomplishing combat missions.

Army Network Testing Conclusion

For the Army to be successful in testing its network, it needs an integrated network architecture and clear requirements. Moreover, the Army Test and Evaluation Command needs to be staffed with the right expertise and equipped with proper digital instrumentation to conduct operational tests on large integrated networks. Absent these key ingredients, there is substantial risk the upcoming INBE will be unable to provide decision-makers with adequate information.

Dr. J. Michael Gilmore
Director of Operational Test and Evaluation
Office of the Secretary of Defense

Dr. J. Michael Gilmore was sworn in as Director of Operational Test and Evaluation on September 23, 2009. A Presidential appointee confirmed by the United States Senate, he serves as the senior advisor to the Secretary of Defense on operational and live fire test and evaluation of Department of Defense weapon systems.

Prior to his current appointment, Dr. Gilmore was the Assistant Director for National Security at the Congressional Budget Office (CBO). In this position, he was responsible for CBO's National Security Division, which performs analyses of major policy and program issues in national defense, international affairs, and veterans' affairs. Specific areas of investigation included the long-term implications of current defense policies and programs, the implications of transformation for equipping and operating U.S. military forces, the effectiveness and costs of alternative approaches to modernizing U.S. military forces, and the resource demands associated with operating and supporting U.S. military forces.

Dr. Gilmore is a former Deputy Director of General Purpose Programs within the Office of the Secretary of Defense, Program Analysis and Evaluation (OSD(PA&E)). As the Deputy Director, he was responsible for developing, formulating, and implementing Secretary of Defense policies on all aspects of Department of Defense general purpose programs, including analyzing the operational effectiveness and costs of U.S. conventional military forces and supporting programs. Before serving as a Deputy Director, Dr. Gilmore served as the Division Director of Operations Analysis and Procurement Planning, within the Office of the Deputy Director, Resource Analysis and prior to that as an Analyst for Strategic Defensive and Space Programs Division, Office of the Deputy Director, Strategic and Space Programs. Dr. Gilmore's service with Program Analysis and Evaluation covered 11 years.

Early in his career, Dr. Gilmore worked at the Lawrence Livermore National Laboratory, Livermore, California performing research in their magnetic fusion energy program. He has also worked as an Analyst with the Falcon Associates, McLean, VA, and the McDonnell Douglas Washington Studies and Analysis Group, where he became Manager, Electronic Systems Company Analysis.

A native of Ohio and resident of Virginia, Dr. Gilmore is a graduate of The Massachusetts Institute of Technology, Cambridge, Massachusetts, where he earned a B.S. in Physics. He subsequently earned a M.S. and Ph.D. in Nuclear Engineering from the University of Wisconsin, Madison, Wisconsin.

United States Government Accountability Office

GAO

Testimony

Before the Subcommittee on Tactical Air and Land Forces, Committee on Armed Services, House of Representatives

For Release on Delivery
Expected at 1:30 p.m. EST
Wednesday, March 9, 2011

DEFENSE ACQUISITIONS

Key Questions Confront the Army's Ground Force Modernization Initiatives

Statement of Michael J. Sullivan, Director
Acquisition and Sourcing Management

GAO-11-425T

GAO
Accountability • Integrity • Reliability

Highlights

Highlights of GAO-11-425T, a testimony before the Subcommittee on Tactical Air and Land Forces, Committee on Armed Services, House of Representatives

March 9, 2011

DEFENSE ACQUISITIONS

Key Questions Confront the Army's Ground Force Modernization Initiatives

Why GAO Did This Study

From 2003 through 2009, the Future Combat Systems program was at the center of the Army's efforts to modernize. But in 2009, DOD canceled the program and instead laid out plans for development of a ground combat vehicle (GCV) program, multiple increments of brigade modernization, and a tactical network.

GCV is intended to modernize the current ground combat vehicle fleet; the early infantry brigade combat team (E-IBCT) to continue previous Future Combat Systems efforts to stage and spin out emerging technologies to current forces; and the tactical information network to provide connectivity, communications, and data for the warfighter. Each of these is in various stages of implementation: GCV is to begin technology development in April 2011; E-IBCT increments have been terminated in early production based on test results; and development of the tactical network is poised to begin.

This testimony focuses on the Army's recent efforts to prepare for a new GCV development program, E-IBCT program test results and decisions, and emerging plans for the tactical network, as well as questions the Army faces as it makes significant decisions in those areas.

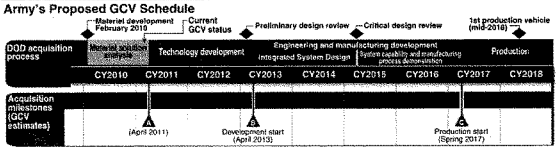
DOD reviewed a draft of this testimony and provided technical comments, which were incorporated as appropriate.

View GAO-11-425T or key components. For more information, contact Michael J.Sullivan at (202) 512-4841 or sullivanm@gao.gov.

What GAO Found

The Army is preparing to start a new GCV acquisition program by evaluating contractor proposals for technology development. The Army appears to be embarking on a more knowledge-based program than previously planned, focusing on costs and technical maturity. Yet, to deliver the first production vehicle in 7 years, the program must complete technology development in 2 years and engineering and manufacturing development in 4 years. Key questions on GCV pertain to how urgently it is needed, robustness of the analysis of alternatives, its cost and affordability, plausibility of its schedule, and whether mature technologies will be used. Addressing such questions is essential to getting a good start on demonstrating the match between GCV requirements and resources by the end of technology development.

Army's Proposed GCV Schedule



Sources: GAO analysis of Army data, the DOD acquisition process, and GAO best practices.

Most of the systems from the first increment of E-IBCT showed little or no military utility in recent tests. Several of the systems have since been terminated but two were approved for additional production. Several questions remain about the future of the remaining development efforts that were once part of the Future Combat Systems program. These questions relate to (1) whether additional procurement of the network integration kit—which includes a radio, computer system, and software—is justified in light of the Army's determination that it is not a viable, affordable, long term solution, and (2) how E-IBCT systems could have met many of their requirements, yet have so little military utility. The Army has also decided not to pursue Increment 2 of E-IBCT. Key questions remain on whether the Army will continue development or terminate other efforts from Future Combat Systems.

The Under Secretary of Defense for Acquisition, Technology, and Logistics recently designated the Army tactical network as a special interest portfolio, signaling a commitment to continued investment in this area, to meet the need for adaptive, evolutionary network approaches. To develop a clear understanding of the network requirements, strategies, and management of a number of disparate acquisitions, the Under Secretary has directed the Army to develop an integrated network architecture and a comprehensive acquisition strategy by this month. Key questions remain on whether the Army has yet clearly defined its internal roles and responsibilities for management of its tactical network, and how it will proceed with development of fundamental parts of the network—the advanced radios and waveforms.

Chairman Bartlett, Ranking Member Reyes, and members of the subcommittee:

I am pleased to be here today to discuss some of the Department of the Army's recent initiatives to modernize its ground forces and begin the development of a new ground combat vehicle (GCV). My statement today is based largely on work we have conducted over the last year in response to a request from this subcommittee. This statement focuses on the Army's recent efforts to initiate a GCV acquisition program, recent developments concerning the first two increments of the Brigade Combat Team modernization systems, and emerging plans for the Army's future tactical network. My statement will include potential issues that the Army is facing as it prepares to make other significant decisions in these areas.

Over much of the past year, we have obtained data and held discussions with Department of Defense (DOD) and Army officials on plans to develop a GCV, make improvements to and test the early infantry brigade combat team (E-IBCT) equipment, and formulate a strategy to develop and demonstrate an information network. To assess the GCV, we reviewed Army and DOD documents, including the Army's draft Analysis of Alternatives Executive Summary, the original GCV request for proposals and the subsequent revision to this document, as well as other documents pertaining to the GCV's development. We also held discussions with GCV program officials. We met with independent test officials to obtain perspectives on the test process and results for the E-IBCT equipment and reviewed the Limited User Test report and the Army's plans for a second increment. We also held discussions with Army officials and reviewed documents related to its network strategy. We also compared all of the Army's plans against best acquisition practices and DOD policy.

This statement is based on work we conducted between June 2010 and March 2011 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Since it started development in 2003, the Future Combat System (FCS) was at the center of the Army's efforts to modernize into a lighter, more agile, and more capable combat force. The Army expected to develop this equipment in 10 years, procure it over 13 years, and field it to 15 FCS-

unique brigades. The Army had also planned to spin out selected FCS technologies and systems to current Army forces. In June 2009, after 6 years and an estimated $18 billion invested, the Under Secretary of Defense for Acquisition, Technology, and Logistics issued an acquisition decision memorandum that canceled the FCS acquisition program, terminated manned ground vehicle development efforts, and laid out plans for follow-on Army brigade combat team modernization efforts. These initiatives included plans for the development of:

- GCV,
- multiple increments of brigade modernization, and
- an incremental tactical network capability.

The Army's GCV program is intended to modernize the current ground combat vehicle fleet, replacing a portion of the Bradley combat vehicles currently in inventory, at a projected cost to develop and acquire of up to $40 billion. The GCV features are expected to include full spectrum capability, robust survivability, capacity for a nine-man squad, and room for growth. The current plans call for a 7-year schedule from the expected approval of technology development start (Milestone A) in April 2011 to a first production vehicle delivered in 2018.[1] In February 2010, the Army issued a request for proposals before completing an analysis of alternatives, citing schedule urgency. In May 2010, the Army convened a "Red Team" to assess the risk of achieving the GCV schedule. The Red Team issued its report in August 2010, citing major risk areas including schedule, technical maturity, and affordability of the system.

The E-IBCT Increment 1 was a continuation of previous FCS-related efforts to spin out emerging capabilities and technologies to current forces and included:

- Class 1 Unmanned Aerial System,
- Network Integration Kit,
- Non-Line-of-Sight Launch System,[2]
- Small Unmanned Ground Vehicle,
- Tactical-Unattended Ground Sensors, and

[1] Milestone A is the point at which a program enters the technology development phase, Milestone B is entry into the engineering and manufacturing development phase, and Milestone C is entry into the production and deployment phase.

[2] The Non-Line-of-Sight Launch System was canceled in May 2010 due to redundancy with existing precision fires programs.

- Urban-Unattended Ground Sensor.

Significant performance shortfalls, particularly system reliability, were revealed during the September 2009 Limited User Test. The pervasive reliability problems in equipment during testing made it difficult to complete a full assessment of performance and the contribution of these systems to military utility. Although never clearly defined, E-IBCT Increment 2 was anticipated to include upgrades to Increment 1 systems, continued development of other FCS systems such as the Common Controller and larger unmanned ground vehicles, and further development of elements of the FCS information network. Since its termination in 2009, the Army has continued many FCS developments. According to Army program data, between March and December 2010, the Army paid contractors over $912 million for development of Increment 2 systems.

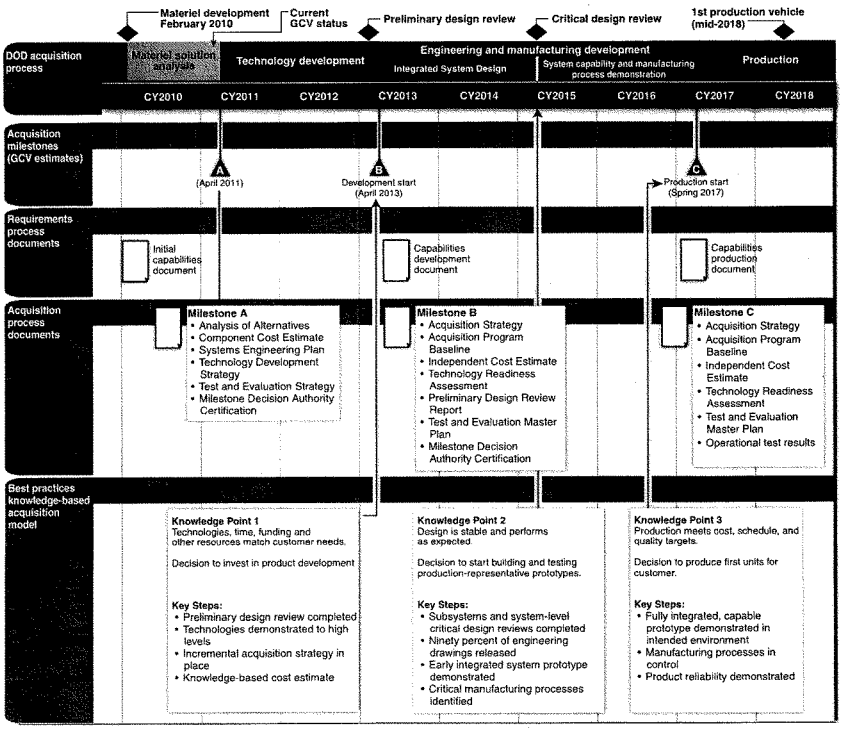
Additionally, the Army has been defining a strategy to develop and field a common tactical information network. Generally, such a system is expected to collect, process, and deliver vast amounts of information, such as imagery and communication while seamlessly linking people and systems. At this time, the Army's strategy is to understand current Army networking capabilities, determine capabilities needed in the 2017-18 time frame, and chart an incremental path to get there. The Army's new network strategy differs from the FCS network strategy primarily due to its incremental nature. The Army is working to document the architecture of the existing communication programs and defining capability gaps. It does not plan to have a single network development program but instead, it plans to rely on numerous programs of record to provide a variety of network capabilities that are expected to be fielded in 2-year incremental packages. It has also proposed a common operating environment which defines the standards and interfaces whereby new network capabilities can be integrated. The Army plans regular demonstrations as the network grows and improves in capability.

Key GCV Questions Must Be Addressed As the Army Approaches the Start of the Technology Development Phase in April and the Engineering and Manufacturing Development Phase in 2 Years

The Army is currently evaluating contractor proposals for the GCV technology development phase and preparing for a Milestone A review in April. In August 2010, the initial request for proposals for GCV was rescinded because of concerns that the program was pursuing a high-risk strategy, with questionable requirements and little concern for costs. In response, the Army issued a revised request for proposals in November 2010 that shifted the focus to more mature technologies to achieve the desired 7-year schedule. This strategy eliminated or reduced many of the requirements cited as unstable or not well understood. The Army has now prioritized the GCV requirements into three groups—a "must have" category, a second group of requirements where the Army intends to be flexible in what it accepts, and a third group deferrable to later increments.

Currently, the Army is evaluating proposals from multiple contractor teams and plans to award up to three fixed price incentive fee contracts for the 24-month GCV technology development phase. During this phase, the requirements will be further refined and subsystem prototypes will be demonstrated. The Army plans to conduct the preliminary design review in advance of the spring 2013 Milestone B review, followed by a 4-year engineering and manufacturing development phase. An initial production decision is expected in the spring of 2017, with the first production vehicle delivered sometime the following year. Figure 1 below illustrates (1) where the program is in the process, (2) the key requirements and acquisition documents needed at each milestone, and (3) the knowledge needed at each milestone per the best practices acquisition model.

Figure 1: GCV Events in the DOD Acquisition Process



Sources: GAO analysis of Army data, the DOD acquisition process, and GAO best practices.

The Army appears to be embarking on a more knowledge-based, incremental acquisition program, focusing on costs and technical maturity. Key questions remain about the urgency of the need for the GCV, the

robustness of the analysis of alternatives, the feasibility of a 7-year delivery schedule, and whether it will use only mature technologies. Resolving these questions could go a long way to informing a knowledge-based decision at the Milestone A review. That, in turn, would be a good starting point for the Army as it proceeds toward the Milestone B decision, now anticipated in spring 2013. At that point, knowledge-based acquisition calls for the Army to clearly demonstrate the match between GCV requirements and the resources available.

Has the Army demonstrated an urgent need for GCV within 7 years?

Questions remain about the urgency of the need for the GCV. In its August 2010 report, the Red Team that was convened by the Army questioned the urgency of the need for the GCV within 7 years. The report concluded that the funds that have migrated from the FCS program were driving the events and activities of the program, versus a true capabilities gap. Further, the team reported that the Army had not provided the analysis supporting the need to rapidly replace the Bradley vehicle. The Army is currently conducting portfolio reviews across many of its missions.[3] The results of the combat vehicle portfolio review should be available soon and should be able to answer questions about urgent need, related questions about the capability needs the GCV is intended to fulfill, and establish the vehicle's priority relative to other weapons systems being reviewed. Decision makers will have to decide if the Army has made a convincing case for the GCV before allowing it to proceed into the technology development phase.

Was the Army's final assessment of the reduced GCV requirements during its analysis of alternatives sufficiently robust?

The initial analysis of alternatives for the GCV considered a broad set of alternatives and did a robust evaluation of requirements and the resources needed to achieve them. The initial GCV design concept was found to be more advantageous than the alternatives considered; however, the analysis team determined that the manufacturing unit cost for a vehicle with these capabilities would be around $18 million—too expensive to meet the Army's affordability goals. The Army then did a series of analyses, trading off various capabilities to eliminate the immediate need for exotic and immature technologies. The analysis of alternatives team performed a quick turn-around analysis of the potential unit cost reductions resulting

[3] A Capability Portfolio Review is an Army process to holistically examine, validate, modify, or make recommendations to terminate requirements driving capability development, acquisition, and sustainment across a series of portfolios defined by the Army but roughly aligned with those defined by DOD.

from those trade-offs. It found that the agreed upon set of trade-offs may reduce the costs enough to achieve the Army's manufacturing unit cost target of $9.5 to $10.5 million and the corresponding reductions in requirements would only modestly degrade vehicle survivability and force protection, while offering as good or better mobility. This analysis of the reduced GCV requirements does not appear to have been as robust and relies on qualitative analysis from subject-matter experts for most of the design trade-offs, instead of the more rigorous quantitative methods used in the initial analysis of alternatives. The analysis also did not compare the capabilities of the new GCV design concept with the wider range of alternatives in the original assessment—such as the Bradley upgrade and some foreign or current vehicles—but only against the current force Bradley vehicles (without upgrades). The merits of the GCV design concept versus the other alternatives should be addressed as part of the upcoming Milestone A review.

Can the Army define GCV requirements that can be met within a 7-year schedule?

While it may be possible for the Army to meet its GCV program requirements on a 7-year schedule, both the Red Team and the Army's analysis of alternatives team found risk with this schedule. The Red Team reported that the risk the GCV would not achieve its requirements within the 7-year schedule constraint was very high, given the available resources, expertise, and recent investments. It reported that it would be possible to moderately improve an existing vehicle within 7 years that could address the most pressing needs, such as survivability and mobility. However, the team estimated that developing the next generation combat vehicle—a new and very different vehicle from what is currently in the force—would take 10 to 12 years. The analysis of alternatives also found that there was a moderate risk in this schedule, particularly in view of an acquisitions environment in which development time has the potential to be longer than expected and, historically, time lines for major defense acquisition programs are longer than this. However, these estimates and predictions were made before the Army both reduced its requirements and urged the use of mature technologies at the start of technology development. Nevertheless, a 4-year engineering and manufacturing phase for an entirely new combat vehicle appears to be ambitious. Therefore, in considering the Army's plans for GCV, decision makers should be careful to apply knowledge-based acquisition principles and not be artificially constrained by the pre-determined fixed schedule.

Will the Army be able to achieve needed capabilities using only mature technologies for GCV?

In response to concerns raised by the Red Team and others, the Army revised its GCV strategy to require that contractors use mature technologies or demonstrate there is a clear path forward to achieve technical maturity. In its analysis of the original request for proposals, the Red Team observed many unstable requirements; low technology readiness levels (TRL) of the proposed armor; and size, weight, and power issues associated with a vehicle that may weigh up to 70 tons.[4] While the analysis of alternatives reported that the combat vehicle technologies were of low or moderate concern, in fact the advanced armor was found to be at a very low level of maturity (TRL 3) and the Active Protection System, which is intended to offer 360-degree protection against rocket-propelled grenades, was not expected to be sufficiently mature (at TRL 5) by 2012. In response, the Army revised the request for proposals, reducing the number of requirements and urging contractors to propose only TRL 6 technologies for the technology development phase or have a clear path forward as to how to achieve this level of maturity. It is not known yet what technologies the contractors have included in their proposals but the two-year technology development phase will limit the range of technologies that will be mature within that period of time. The program's success will require the DOD and the Army to remain disciplined by maintaining a focus on the achievable and to avoid the requirements creep that has been so common in other programs.

[4] Technology readiness levels are measures pioneered by NASA and adopted by DOD to determine whether technologies were sufficiently mature to be incorporated into a weapon system. Our prior work has found TRLs to be a valuable decision-making tool because they can presage the likely consequences of incorporating a technology at a given level of maturity into a product development. The maturity level of a technology can range from paper studies (TRL 1), to prototypes that can be tested in a realistic environment (TRL 7), to an actual system that has proven itself in mission operations (TRL 9). According to DOD acquisition policy, a technology should have been demonstrated in a relevant environment (TRL 6) or, preferably, in an operational environment (TRL 7) to be considered mature enough to use for product development. Best practices of leading commercial firms and successful DOD programs have shown that critical technologies should be mature to at least a TRL 7 before the start of product development.

What are the key tasks required for the Army to demonstrate a match between GCV requirements and costs at Milestone B?

By Milestone B, the Army should be able to use the knowledge gained during the technology development phase to complete its capability development document, which should outline an affordable increment of militarily useful, logistically supportable, and technically mature capability. Significant systems engineering analysis and knowledge will be required to confirm that the technologies are mature enough for system integration; that, through a thorough and disciplined system-level preliminary design review, the design is sound enough to move into integration; and that a cost estimate based on adequate systems engineering knowledge is available to show that development and production will be affordable and the system will meet the requirements. The cost and affordability of the program must be confirmed through rigorous, independent cost estimates and an assessment made of whether the program is affordable in light of budget constraints. An independent technology assessment should confirm the maturity of the technology as the capability development document confirms the requirements. Finally, the feasibility and risks in the acquisition strategy and schedule should be assessed by independent specialists. The Army has also stated it will consider all contract vehicle types, including fixed price, for the engineering and manufacturing development phase. The strategy should also feature a timely and thorough critical design review and include plans for robust demonstrations of GCV prototypes as early as possible. Particular attention should be given to GCV's schedule-driven acquisition.

Most E-IBCT Increment 1 Systems Demonstrated Little Military Utility in User Tests and the Army Does Not Plan To Pursue E-IBCT Increment 2

Recent limited user tests conducted by the Army and assessed by the Director, Operational Test and Evaluation that were performed during fiscal year 2010 yielded startling results—most Increment 1 systems showed little or no military utility. In response, the Army has terminated several systems and only two were approved for additional procurement—the small unmanned ground vehicle and the network integration kit. These events have raised questions about the Army's process for establishing requirements. And while the small unmanned ground vehicle performed well in tests, the military utility of the costly network integration kit remains in doubt, and the Army has stated that the kit is not a viable, affordable, long term solution. For us, that raises questions about the desirability of continued procurement of the kit. Because Increment 1 systems have been deemed to provide little military utility, the Army and DOD decided to cancel the entire E-IBCT program, which effectively put an end to both increments. Nevertheless, the Army continues to assess whether additional investments are warranted in the remaining systems and capabilities from the FCS program. To avoid unnecessary expenditures, the Army needs to expedite this process. As indicated on

table 1, the user tests provided information on the systems' ability to meet their performance and reliability requirements as well as provided determinations on military utility.

Table 1: E-IBCT Increment 1 2010 Limited User Test demonstrated performance and reliability requirements, and military utility assessments

	Demonstrated performance requirements	Reliability requirements	Military utility effectiveness assessment	Military utility suitability assessment	Military utility survivability assessment
Network Integration Kit	Majority but not all	Met	None or limited	None	Limited
Urban Unattended Ground Sensor	Majority but not all	Met	None	None	None
Class 1 Unmanned Aerial System	Majority but not all	Not met	Limited	None	Limited
Tactical Unattended Ground Sensor	Majority but not all	Met	Limited	None	None
Small Unmanned Ground Vehicle	Majority but not all	Met	Effective	Effective	Limited

Source: Army Test and Evaluation Command's Operational Test Agency Milestone C Assessment Report.

During the Limited User Test, the systems displayed improved reliability, relative to previous testing, and demonstrated a majority of their performance requirements. However, with the exception of the small unmanned ground vehicle, the systems provided little or no military utility. Relative to the other systems, the small unmanned ground vehicle performed well in these tests—it met most of its requirements and was assessed well on military utility. As a result, in February 2011, the Under Secretary of Defense for Acquisition, Technology, and Logistics (1) concurred with an earlier Army decision to end development efforts for all of the elements of Increment 1; (2) approved production of two sets of small unmanned vehicles and directed the Army to consider further vehicle production under a separate program; and, (3) responding to the Army's desire to keep network demonstration efforts active, approved procurement of one additional brigade set of network integration kits despite disappointing performance in the user tests. The decision made potential fielding of the kits—radios, waveforms, integrated computer system, and software—contingent on user testing that successfully demonstrates that it can improve current force capabilities.[5] Additionally,

[5] A waveform is the representation of a signal that includes the frequency, modulation type, message format, and/or transmission system.

the decision recognized the need for addressing a number of known kit deficiencies, such as the ability to effectively communicate while moving and with current Army radio formats.

Is additional procurement beyond what is needed for network integration kit testing justified?

The Army now plans to perform additional testing this spring and summer to determine whether (1) a brigade would be better equipped with a network integration kit than without it, (2) fielding is warranted, or (3) further program modifications are needed. The Army maintains that the kit is needed to capitalize on waveform, radio, and integrated computer system efforts to deliver the networking capabilities for company and platoon use. However, for a program currently in production, a number of critical technologies key to the kit's performance remain immature. The Army and the Director, Defense Research and Engineering have both assessed a critical technology key to the kit's performance—the Wideband Networking Waveform—at a maturity level well below what would be expected of a program in the production stage of development.[6] The Director also indicated that there is a high risk that the technology will not mature as expected and also considers the technology to be potentially flawed. Additionally, the Director has assessed another key critical technology for the kit—the Soldier Radio Waveform—at a technology maturity level well below what would be expected of a program in production.

Furthermore, each kit is estimated to cost almost $800,000 with 81 already in production and with up to 100 more to be produced and purchased by the Army. The Army has not yet finalized its plans for fielding the additional units if the known deficiencies of the kits are corrected and additional testing is successful. While continued development and testing of the kit may be appropriate, procurement of up to 181 units seems far beyond what may be needed for testing. By comparison, about 15 kits were used in the 2010 E-IBCT limited user testing. If the kit is not a viable, affordable, long term solution as the Army has stated, we question why it is procuring kits for fielding.

[6] The Director, Defense Research and Engineering is now known as the Assistant Secretary of Defense for Research and Engineering.

How could E-IBCT Increment 1 systems have met many of their performance requirements in testing but be found to lack sufficient military utility?

Army officials have expressed their concerns to us about how the E-IBCT systems could have met many performance requirements yet be found to offer little or no military utility during recent testing. The capabilities demonstrated by the E-IBCT systems were often overshadowed by the unanticipated burdens, such as the network integration kit's extensive start-up procedures or the lengthy and extensive emplacement times for the tactical unattended ground sensor.

The Army is planning to conduct a review of its processes for setting requirements and provide its own assessment of this situation. One possible explanation may be the supporting rationale for the E-IBCT systems. As we have stated previously, the E-IBCT Increment 1 systems were a continuation of previous FCS-related efforts to spin out emerging capabilities and technologies to current forces. FCS was to be a synergistic system-of-systems. The Army conducted a single analysis of alternatives for the program and concluded that an FCS-equipped brigade would be more effective than other Army combat brigades. When the FCS program was terminated, the Army restructured the program into the E-IBCT Modernization, which aimed to field subsets of former FCS systems to the current force. However, this decision was not informed by analyses of alternatives for the individual systems. Such analyses would have informed decision makers about the systems' individual ability to satisfy a mission need outside of the earlier FCS fighting construct, which may have provided insights into their potential military utility.

What rationale will the Army use in deciding which of the remaining FCS systems or capabilities to terminate or continue in development?

Despite the decision to cancel the E-IBCT program, the Army has not entirely ruled out additional development for some of these systems. Prior to its cancellation decision, the Army transferred program management responsibility for the systems from its Program Executive Office for Integration to other, separate program executive offices. According to an Army official, the Army has been working for almost 2 years to draft analyses of alternatives for each of these systems to determine whether to continue investing in their development as separate programs. Those analyses should provide insights about the potential benefits of the systems.

The Army is also considering whether to continue development activities for other systems or capabilities that were being developed within the FCS program. For example, within FCS, the Army was working on a larger unmanned ground vehicle being designed to provide transport of equipment and/or supplies for the dismounted soldier. The Army is now considering system development for what it calls a Squad Mission

Equipment Transport, which appears similar to what the Army was attempting to achieve with the larger FCS unmanned ground vehicle. The Army was also developing another FCS unmanned system which would provide a remote reconnaissance, sensing, and direct-fire capability. The development of this system was previously under the purview of Program Executive Office for Integration and was mentioned as a potential E-IBCT Increment 2 system. The management responsibility for that system has been transitioned to Program Executive Office for Ground Combat Systems, which is also responsible for the Squad Mission Equipment Transport. It appears the Army is preparing capability description documents for these two new systems, but plans for their further development are unclear. The Common Controller is another system that emerged from the FCS program. It was designed to provide a single unit for controlling sensors and multiple unmanned platforms, like the Class I unmanned aerial system and the small unmanned ground vehicle. The fate of the Common Controller is unclear at this point.

Finally, the Army still has plans for a common operating environment, which is software designed to connect command and control systems to the software applications, and the work that was begun under FCS has been transitioned to a government laboratory for further development and incorporation into its longer-term networking initiatives. Another network-related FCS initiative the Army may continue to develop is the Warfighter-Machine Interface. This was the primary soldier computer system that would display the common operating picture and allow soldiers access to most of the software services.

Army Tactical Information Network Designated As Special Interest Portfolio

The Under Secretary of Defense for Acquisition, Technology, and Logistics has recently designated the Army tactical network as a special interest portfolio and instructed the Army to develop an integrated network architecture and a comprehensive acquisition strategy. The Under Secretary stated that lessons learned from recent testing highlight the need for adaptive, evolutionary network approaches. The first step, in his view, is establishing a clear understanding of the network requirements, strategies, and management of a number of disparate communications and command and control acquisitions. He instructed the Army to develop an integrated network architecture and a comprehensive acquisition strategy by March 2011. To that end, the Army has developed a network demonstration strategy and the Army Chief of Staff has ordered it be expeditiously implemented. A key aspect of its implementation will be aligning the schedules of the separate programs of record with the Army's plans to conduct periodic demonstrations of the overall information

network. A major network test and evaluation is being planned for June 2011. Two issues deserve additional attention: (1) whether the Army has clearly defined its internal roles and responsibilities for management of its tactical network, and (2) how recent developments have impacted the Army's radio and waveform plans.

Has the Army clearly defined its internal roles and responsibilities for management of its tactical network?

The Army does not plan to have a single network development program, but instead will rely on numerous programs to provide a variety of network capabilities. This proved to be a challenge under FCS. The Army planned to use complementary systems to provide a portion of the FCS's anticipated capabilities. These were systems that were managed and developed under separate program offices, much like what the Army is considering with this proposed networking approach. The Army discovered that the programmatic challenges associated with those separate developments complicated plans to utilize them in FCS. Relying on separate development programs to provide needed capabilities for the FCS program proved more challenging than expected. To date, Army officials have told us that two separate Army groups could be involved but details about the specific role and authority of these organizations for coordinating the Army network strategy are not yet well defined. As the Army continues to define and implement its network strategy, we would expect to see more clarity on its internal management roles and responsibilities.

How have recent developments impacted the Army's radio and waveform plans?

The Network Integration Kit was expected to be a fundamental part of the Army's information network. The Army has tentatively decided to complete development of the Joint Tactical Radio System ground mobile radio but it does not plan to procure large quantities of these particular radios for any network integration kits. Army officials say that, in the future, they intend to purchase comparable radios, but they intend to pursue them in a competitive environment and not be restricted to a single vendor. It is not yet clear how and when the Army intends to implement this plan.

According to an Army official, the Army plans for the future tactical network will include the wideband networking and soldier radio waveforms, which have been under development for use on the Joint Tactical Radio System family of radios. However, the Army has had trouble maturing these waveforms for several years and they are still not at acceptable levels of maturity. For example, a March 2010 independent DOD assessment indicated that the technologies are more akin to low-

fidelity prototypes that lack functionality rather than high-fidelity prototypes with full functionality. The Army believes it has made progress in recent waveform testing. However, the technical maturity of these waveforms may still be in question and that needs to be considered as the Army proceeds with implementation of its network strategy.

Concluding Remarks

The Army has had to make many difficult modernization decisions over the last decade, such as the termination of Armed Reconnaissance Helicopter, termination of FCS, and truncating E-IBCT Increment 1. E-IBCT, the Army's initial post-FCS modernization effort, has not worked out very well. The recent cancellation of the E-IBCT Modernization program signals another step away from the FCS, but it also presents questions the Army must address. When I appeared before this committee this time last year, I testified that none of these systems have been designated as an urgent need, and that it is not helpful to provide early capability to the warfighter if those capabilities are not technically mature or reliable. We cautioned that if the Army moved forward too fast with immature designs that it could cause additional delays as the Army and its contractors concurrently address technology, design, and production issues. The Army needs to look ahead and base its acquisition decisions on well thought-out requirements and knowledge-based acquisition principles.

After the rough start with the GCV effort, the Army has shown a willingness to rethink its original approach that other experts believed was flawed. By retracting the original request for proposals and addressing some of the concerns raised by independent evaluators, the Army was able to introduce improvements. However, as the Army continues toward the GCV's technology development phase, it must address several questions in order to position the program for successful execution. While the Army has done much to put it on a better path, the GCV acquisition strategy is still very ambitious, with a 2-year technology development phase and a 4-year engineering and manufacturing development phase. Now is the time for DOD and the Army to determine whether the proposed timeframes are sufficient for the program's scope. If the necessary acquisition knowledge cannot be developed within those time frames, additional time and resources may need to be added. The Army also has to retain both the flexibility and resolve to ensure that the right work gets done in the technology development phase—robust system engineering, technology development, cost estimating, and requirements definition—to make for success in the remainder of the program. GCV, if done right, could be a breakthrough in Army acquisition. However, if the Army does not adhere

to acquisition policy and best practices on GCV, it could end up in the same failed position that it found itself in with FCS and other programs.

Moreover, DOD and Army decisions on when and how the GCV program enters the acquisition process will help to define how recent acquisition legislation and policy will actually be implemented. The decisions made on the program will be symbolic from that standpoint. If GCV does not measure up to the standards in law and in policy, yet is approved and wins funding, it will be a setback to acquisition reform. The Congress and DOD have enacted acquisition reforms in legislation and policy, now is the time to enable and enforce those reforms at the service, DOD and congressional levels.

Chairman Bartlett, Ranking Member Reyes, and members of the subcommittee, this concludes my prepared statement. I would be happy to answer any questions you or members of the subcommittee may have.

Contacts and Staff Acknowledgments

For future questions about this statement, please contact me on (202) 512-4841 or sullivanm@gao.gov. Individuals making key contributions to this statement include William R. Graveline, Assistant Director; William C. Allbritton; Noah B. Bleicher; Beverly A. Breen; Marcus C. Ferguson; and Robert S. Swierczek.

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.

GAO's Mission	The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.
Obtaining Copies of GAO Reports and Testimony	The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday afternoon, GAO posts on its Web site newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to www.gao.gov and select "E-mail Updates."
Order by Phone	The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's Web site, http://www.gao.gov/ordering.htm. Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537. Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.
To Report Fraud, Waste, and Abuse in Federal Programs	Contact: Web site: www.gao.gov/fraudnet/fraudnet.htm E-mail: fraudnet@gao.gov Automated answering system: (800) 424-5454 or (202) 512-7470
Congressional Relations	Ralph Dawn, Managing Director, dawnr@gao.gov, (202) 512-4400 U.S. Government Accountability Office, 441 G Street NW, Room 7125 Washington, DC 20548
Public Affairs	Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800 U.S. Government Accountability Office, 441 G Street NW, Room 7149 Washington, DC 20548

Please Print on Recycled Paper

Michael J. Sullivan
Director, Acquisition and Sourcing Management Team
U.S. GAO, Dayton Field Office
(937)258-7915
sullivanm@gao.gov

Mr. Sullivan currently serves as Director, Acquisition and Sourcing Management, at the U.S. Government Accountability Office. This group has responsibility for examining the effectiveness of DOD's acquisition and procurement practices in meeting its mission performance objectives and requirements. In addition to directing reviews of major weapon system acquisitions such as the Joint Strike Fighter, F-22, Global Hawk, and various other major weapon acquisition programs, Mr. Sullivan has developed and directs a body of work examining how the Department of Defense can apply best practices to the nation's largest and most technically advanced weapon systems acquisition system. This work has spanned a broad range of issues critical to the successful delivery of systems, including technology development; product development; transition to production; software development; program management; requirement-setting; cost estimating; and strategic portfolio management. The findings and recommendations from this work have played a major role in the department's recent acquisition policy revisions. Most recently, he has directed the GAO's annual assessment of major weapon systems programs for the Congress and GAO's work with Congress in establishing acquisition policy reforms. His team also provides the Congress with early warning on technical and management challenges facing these investments.

Mr. Sullivan has been with GAO for 24 years. He received a bachelor's degree in Political Science from Indiana University and a Masters Degree in Public Administration from the School of Public and Environmental Affairs, Indiana University.

Bio for Bill Graveline, Assistant Director

GAO's Acquisition and Sourcing Management Team

Bill graduated in 1974 from Bryant College in Smithfield, RI with a bachelor's degree in business administration (accounting). He worked for GAO in Washington from 1974 to 1997 when he transferred to GAO's Huntsville, AL office. He has been involved in audits of defense procurement, acquisition programs, and related issues for most of his 36-year federal career. He attended the Defense Systems Management College's Program Manager Course in 1985. As assistant director, he is responsible for GAO reviews of Army, Navy, and Air Force missile and munitions programs as well as Army and Marine Corps ground programs. For the last several years, he has managed GAO's extensive reporting on the status of the Army's Future Combat System program and the post-FCS acquisition plans. He has also managed GAO engagements on the role of the FCS Lead System Integrator; DOD's testing and procurement of body armor; Army and Marine Investment Strategies for Tactical Wheeled Vehicles, the Army's Armed Reconnaissance Helicopter; the Army's Sky Warrior Unmanned Aerial Vehicle; the Joint Air-to-Surface Standoff Missile, and the Army's Joint Air-to-Ground Missile program. He has also been a major contributor to GAO's Annual Assessment of DOD's Acquisition Programs. Bill is also the field office manager of GAO's Huntsville office.

WITNESS RESPONSES TO QUESTIONS ASKED DURING THE HEARING

MARCH 9, 2011

RESPONSE TO QUESTION SUBMITTED BY MR. BARTLETT

General CHIARELLI. [The information was not available at the time of printing.] [See page 21.]

RESPONSE TO QUESTION SUBMITTED BY MR. PLATTS

General LENNOX. [The information was not available at the time of printing.] [See page 14.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MARCH 9, 2011

QUESTIONS SUBMITTED BY MR. BARTLETT

Mr. BARTLETT. I am pleased to see the Improved Turbine Engine Program (ITEP) supported as an Army priority. This program greatly reduces fuel consumption and increases power for the Black Hawk and Apache fleets and provides the engine for the next generation helicopter. I am concerned that all too often we make premature selections that result in schedule and cost escalation and cancelled programs. It is important that this program embraces competition through flight demonstration in order to reduce risk and validate operational capability. Please keep congress informed on the acquisition strategy and status of this key program. Please explain what measures the Army is taking in the acquisition strategy to ensure there is competition beyond the Science & Technology phase and into Flight Demonstration.

General CHIARELLI. [The information was not available at the time of printing.]

Mr. BARTLETT. 1. In a recent "Inside the Army" article there was a quote that said the Early-Infantry Brigade Combat Team is a "great example of how technology changes so rapidly, based on requirements that were written a long time ago." Might not the same logic apply to the various pieces of "the network," Nett Warrior, and other future Army systems still in the acquisition pipeline? What is the Army doing now to ensure that the requirements for these systems have also not grown stale?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. 2. The committee noted that the Early-Infantry Brigade Combat Team (E–IBCT) test results in 2010 were not very different from the results of the 2009 E–IBCT operational tests, with the exception of improved reliability of several systems. Our concern is that DOD and the Army spends millions of dollars and a great deal of institutional energy on these tests. Do you believe that the Army is capturing and applying the lessons learned from these operational tests?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. 3. The committee noted that the 2010 Early-Infantry Brigade Combat Team (E–IBCT) operational test not only revealed weaknesses in several E–IBCT systems, but also noted the lack of military utility of the network itself. The Army now has another important network operational test planned for this summer. What is the Army's plan should this test also reveal that soldiers and their leaders don't see utility in these new and expensive communications systems?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. 4. With regards to Ground Combat Vehicle, the committee notes that the Army plans to use mature technologies rather than concurrently chase some future as-yet-invented ones. We agree with that approach. However, since whatever replaces the Bradley Fighting Vehicle will have many of the same capabilities as our latest model Bradley fleet, has the Army considered other, non-new-materiel and perhaps far cheaper solutions such as changes to doctrine, training, manning, organization, etc.? For example, adding a fifth Bradley Fighting Vehicle to mechanized infantry platoon formations?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. 5. The Army has stated that its number one modernization priority is the Ground Combat Vehicle (GCV) which may enter production in 2017 and replace the Bradley Infantry Fighting Vehicle. The Abrams tank will remain in the inventory for the foreseeable future. As you know, this committee has long been concerned over the lack of balance between investment in the Army's current and future force. There are concerns that it may be too early to put all our eggs in the one basket of GCV. We probably won't have a better understanding in regards to what is doable in terms of GCV for a few more years. In the mean time, what is the Army doing to upgrade the current fleet including the Abrams tank in terms of RDTE and production?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. 6. What was the impact of terminating the Future Combat Systems Program and what has the Army learned from recent Limited Users Testing at Fort Bliss, TX?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. 7. What is the extent of the Army's R&D effort to reduce the weight of body armor systems? What are your thoughts in establishing a task force similar to the MRAP Task Force and ISR Task Force to accelerate these efforts?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. 8. There is no funding in fiscal year 2012 for new production high mobility multipurpose wheeled vehicles (HMMWV or 'humvee'). Could you please elaborate on the Army's acquisition strategy for Humvees?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. 9. In today's austere budget environment, can the Army afford to procure the Joint Light Tactical Vehicle (JLTV) at a base unit cost of $300–400,000 and a total unit cost of $700–800,000? I understand the Army plans to procure about 50,000 JLTVs. How much better than the Humvee is JLTV projected to be?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. 10. As it currently stands, the Abrams tank program is set to have a production break (of upgraded vehicles) in 2013 and a full blown Abrams modernization effort isn't scheduled to begin until 2016. Some might say that it is too expensive to continue to upgrade battle tanks just to keep the industrial base employed. However, this issue is much larger than that. Would we let our only tactical fighter producer close down production 5 years before its replacement was scheduled to be procured? And while Foreign Military Sales (FMS) may have been a possible risk mitigation in the past, the current FMS market is uncertain. Is the Army currently looking at any alternatives to minimize the impact of this production break? For example, is it possible to upgraded older National Guard tanks to bring them in line with the most modern version that the Active Duty forces have?

General CHIARELLI, General PHILLIPS, and General LENNOX. [The information was not available at the time of printing.]

Mr. BARTLETT. It is my understanding that a contract to manufacture M915 line haul tractors was competitively awarded to Freightliner, now Daimler Trucks North American, on September 8, 2000. I also understand it was a 7-year requirements contract, that has since been extended for 3 years on a sole source basis. Now the Army is proposing to buy another 222 vehicles sole source using anticipated FY 11, 12 and 13 funds. It is also my understanding that the justification for the sole source award is that competition would result in unacceptable delays and duplicative costs.

1. Is it correct to say that the M915A5 line haul tractor the Army is buying sole source is just an upgraded version of a vehicle designed almost two decades ago?

General PHILLIPS. [The information was not available at the time of printing.]

Mr. BARTLETT. 2. What are the major differences in the original configuration and the configuration of current vehicles?

General PHILLIPS. [The information was not available at the time of printing.]

Mr. BARTLETT. 3. Since it has not held a competition in nearly 11 years, how does the Army know it is getting the best truck available for the best possible price? Is it possible that industry could provide a safer more fuel efficient truck at less cost than the Army is paying for the M915A5?

General PHILLIPS. [The information was not available at the time of printing.]

Mr. BARTLETT. 4. The J&A provided this committee stated that it would take 39 months to begin full rate of production of a new line haul tractor. That seems like a very long time to buy what is essentially, a commercial vehicle. But assuming that is an accurate projection, why is it unacceptable, since none of the funds requested for FY 11 were identified for Overseas Contingency Operations?

General PHILLIPS. [The information was not available at the time of printing.]

Mr. BARTLETT. 5. The Army procured MRAP and Stryker vehicles competitively during a time of war, why can't it buy a truck?

General PHILLIPS. [The information was not available at the time of printing.]

Mr. BARTLETT. 6. The other justification for making a sole source award is that a competition would result in duplicative costs of $20.8 million that could not be recovered through competition. These included buying test vehicles, operational tests, logistics costs and Armor kits. One, how does the Army know it could not recover those costs since it hasn't held a competition in nearly 11 years? Second, aren't similar costs incurred as part of any acquisition? If the Army's logic who ex-

trapolated to every vehicle or weapon it buys, wouldn't it be forced to continue buying the same product from the same vendor in perpetuity?

General PHILLIPS. [The information was not available at the time of printing.]

Mr. BARTLETT. Also, the J&A stated that Daimler would pay some of the costs for the proposed sole source procurement. Please provide for the record, the legal basis for this arrangement (i.e. the governing statute, FAR provision, comptroller general decision and case law). Please provide for the record:

a. The schedule for delivering each of the 222 vehicles the Army plans to procure sole source to units and identify when those units are expected to deploy to Afghanistan or Iraq.

General PHILLIPS. [The information was not available at the time of printing.]

Mr. BARTLETT. b. The procurement history for the MRAP and Stryker vehicles to include: the date the RFP was issued; the length of time for safety/operational testing and date that full rate of production began.

General PHILLIPS. [The information was not available at the time of printing.]

Mr. BARTLETT. 1. One of the striking outcomes of the 2010 limited user testing of the Early-Infantry Brigade Combat Team equipment was that a majority of performance requirements were demonstrated but that the equipment provided little or no military utility for the force. From your perspective, could you offer an explanation on how this outcome could have possibly occurred? We understand that the results of the 2009 limited user testing were obscured by the poor reliability of the equipment being tested. Are you more confident with the results of the 2010 limited user testing?

Mr. GILMORE. [The information was not available at the time of printing.]

Mr. BARTLETT. 2. One of the two Early-Infantry Brigade Combat Team items of equipment that is moving forward is the Network Integration Kit (NIK). However, its performance during the 2010 limited user testing was marginal at best. Do you think that the testing was robust enough to either demonstrate its potential or its true limitations? Some of the test findings were that the NIK was cumbersome to operate and its contribution to the operating unit was quite small. Are these correctable issues, in your view, or is there still hope for more positive results on the NIK?

Mr. GILMORE. [The information was not available at the time of printing.]

Mr. BARTLETT. 3. At the heart of the Network Integration Kit's (NIK) problems seem to be the Joint Tactical Radio Systems (JTRS) and its complex waveforms. Although some technical experts have expressed grave concerns about the viability of these radios and waveforms, the Army seems intent on going forward with them in some fashion. From a test perspective, do we know enough yet to make an informed decision on the future of these technologies?

Mr. GILMORE. [The information was not available at the time of printing.]

Mr. BARTLETT. 4. The Army plans on establishing the Fort Bliss complex with a full composite brigade to, among other things, conduct regular demonstrations of the current tactical network as well as possible upgrades. Given the significant investments involved in this objective, do you support the Army's network demonstration plans? Do the DOD and Army test communities have the necessary resources to monitor and evaluate the Army plans for network demonstrations?

Mr. GILMORE. [The information was not available at the time of printing.]

Mr. BARTLETT. One of the striking outcomes of the 2010 limited user testing of the EIBCT equipment was that a majority of performance requirements were demonstrated but that the equipment provided little or no military utility for the force. From your perspective, could you offer an explanation of how this outcome could have possibly occurred? We understand that the results of the 2009 LUT were obscured by the poor reliability of the equipment being tested. Are you more confident with the results of the 2010 LUT?

Mr. SULLIVAN and Mr. GRAVELINE. First of all, the requirements were probably not thoroughly refined and vetted with the ultimate users of the equipment. For example, the Network Integration Kit has proven to be troublesome for the operators and its startup process is complicated and time consuming. These are things that the operators or users may have readily pointed out much earlier. Second, there was too much focus on what the equipment was expected to do and not enough focus on what burdens it may impose on the users. The Tactical Unmanned Ground Sensor did fairly well in detecting approaching threats but it was much heavier than expected and was time consuming to put in place and to support. The Class I unmanned aerial system was expected to "hover and stare" and send back video on enemy locations. However, it turned out to be very noisy and that eliminated any possibility of stealthy operations. Third, as we predicted earlier, the equipment was not technically mature and was not ready for production or fielding, no matter the perceived urgency in doing so. Fourth, the E–IBCT Increment 1 systems were a continuation of previous Future Combat System (FCS)-related efforts to spin out emerg-

ing capabilities and technologies to current forces. FCS was to be a synergistic system-of-systems. The Army conducted a single analysis of alternatives for the program and concluded that an FCS-equipped brigade would be more effective than other Army combat brigades. When the FCS program was terminated, the Army restructured the program into the E–IBCT Modernization, which aimed to field subsets of former FCS systems to the current force. However, this decision was not informed by analyses of alternatives for the individual systems. Such analyses would have informed decision makers about the systems' individual ability to satisfy a mission need outside of the earlier FCS fighting construct, which may have provided insights into their potential military utility. Finally, the poor reliability of the equipment did seem to prevent an earlier understanding of their poor military utility. Moreover, given the fact that the evaluations of the 2010 Limited User Tests from both the Army Test and Evaluation Command and the Director of Operational Test and Evaluation reached the same conclusions, we are confident in the results of testing.

Mr. BARTLETT. One of the two EIBCT items of equipment that is moving forward is the NIK. However, its performance during the 2010 LUT was marginal at best. Do you think that the testing was robust enough to either demonstrate its potential or its true limitations? Some of the test findings were that the NIK was cumbersome to operate and its contribution to the operating unit was quite small. Are these correctable issues, in your view, or is there still hope for more positive results in the NIK?

Mr. SULLIVAN and Mr. GRAVELINE. We would leave it up to the test and evaluation experts to determine whether the 2010 limited user testing was sufficiently robust. However, the NIK's performance in that testing was marginal at best and it did not contribute very much to the unit's effectiveness. This indicates that the testing was at least robust enough to expose operational inadequacies in the NIK systems. The Under Secretary approved additional NIK production but directed the Army to correct a number of deficiencies and continue testing before fielding the NIK to operating units. We believe that this is vitally important. Only systems that are proven to be reliable and capable should be fielded to our warfighters. Hopefully, the Army can identify solutions to the NIK deficiencies in the coming months but those solutions will need to be thoroughly demonstrated in testing. Moreover, it is important to keep in mind that the Army has clearly stated that they do not consider the NIK to be a viable, affordable, long-term solution. We agree and do not see the need to procure any more NIKs than those needed for testing.

Mr. BARTLETT. At the heart of the NIK's problems seems to be the JTRS and its complex waveforms. Although some technical experts have expressed grave concerns about the viability of these radios and waveforms, the Army seems intent on going forward with them in some fashion. From a test perspective, do we know enough yet to make an informed decision on the future of these technologies?

Mr. SULLIVAN and Mr. GRAVELINE. The Army has been developing JTRS radios and associated waveforms for about 13 years. Maturity levels for the associated technologies have not improved much during that time. While the Army has demonstrated some improved reliability at the 2010 Limited User Test and reported some success in more recent testing, the systems have not yet proven to be militarily useful. Additional testing is to be conducted shortly. Thirteen years of knowledge exists about the performance of the JTRS program and associated waveforms, and it is up to the Army, DOD, and the Congress to make the necessary and prudent decisions based on that knowledge. We would defer to DOT&E to provide the test perspective on the viability and future of these technologies.

Mr. BARTLETT. The Army plans on establishing the Fort Bliss complex with a full composite brigade to, among other things, conduct regular demonstrations of the current tactical network as well as possible upgrades. Given the significant investments involved in this objective, do you support the Army's network demonstration plans? Do the DOD and Army test communities have the necessary resources to monitor and evaluate the Army plans for network demonstrations?

Mr. SULLIVAN and Mr. GRAVELINE. In our acquisition best practices work, we have advocated an incremental development approach as well as thorough testing of systems before production and fielding. In the case of the evolving networking systems, the Army Evaluation Task Force will periodically receive equipment that it will test and train with so that soldiers can provide feedback to developers for system improvements. It will also provide Army and DOD officials with information that will help them make production decisions and better plan fielding of the network systems. In the past, we have commented on the task force's potential advantages, like having a near brigade-sized unit testing prototypes and incorporating soldier feedback into the design process. While there may be some advantages with the Army's new process, it will have a substantial cost. For example, the projected spending for

brigade combat team network integration, modeling, simulation, test and evaluation for fiscal year 2011 is $169 million. Finally, we would prefer that the test community comment on the adequacy of the resources available to monitor and evaluate network development and demonstration.

QUESTIONS SUBMITTED BY MR. LOBIONDO

Mr. LOBIONDO. The Army's Fiscal Year 2012 Research, Development, Test and Evaluation budget shows a decrease in funding for Abrams Tank Improvement program from $107.5 million in Fiscal Year 2011 to $9.7 million in Fiscal Year 2012—close to a 90% reduction in funding. However, in the accompanying budget material provided to the Committee, the Army notes the Abrams tank has "virtually reached its upper limits for space, weight and power." And, the Abrams tank is expected to be in service through 2045. Moreover, it appears the Army doesn't plan to address engine improvements until the second increment of the Abrams Modernization Program—which we understand could be as early as Fiscal Year 2018.

1. How does current Abrams Modernization Program account for engine technology insertion in the Fiscal Year 2012 budget and associated Program Objective Memorandum?

General CHIARELLI. [The information was not available at the time of printing.]

Mr. LOBIONDO. 2. It is anticipated the engine improvements will yield approximately 50 gallons of fuel savings per mission day; how does the Army account for return on investment in the decision making process for Abrams Modernization?

General CHIARELLI. [The information was not available at the time of printing.]

Mr. LOBIONDO. 3. Assuming the Army had the available resources for power train improvements in Fiscal Year 2012, what power train technology insertion programs could the Army implement for the Abrams Modernization Program? Please include costs, benefits and program element numbers for each power train technology insertion program.

General CHIARELLI. [The information was not available at the time of printing.]

QUESTION SUBMITTED BY MR. ROONEY

Mr. ROONEY. The Committee understands that the Army plans to extend the Abrams service life through 2045. Based on budget information provided to this Committee, the Army does not intend on modernizing the engine of the Abrams tank until past 2018. The power train accounts for 60% of the annual maintenance costs for the Abrams tank. The facts would seem to lend themselves to a far greater urgency for an engine upgrade. The Army has not truly upgraded the Abrams engine in 20 years. Shouldn't any decision on Abrams modernization also include prioritizing the engine upgrade?

General CHIARELLI. [The information was not available at the time of printing.]

QUESTIONS SUBMITTED BY MR. AKIN

Mr. AKIN. 1. The Committee understands that the Army plans to extend the Abrams service life through 2045. Based on budget information provided to this Committee, the Army does not intend on modernizing the engine of the Abrams tank until past 2018. The powertrain accounts for 60% of the annual maintenance costs for the Abrams tank. The facts would seem to lend themselves to a far greater urgency for an engine upgrade. The Army has not truly upgraded the Abrams engine in 20 years. In light of this significant delay in upgrading the engine, does the Army still support Abrams modernization?

General PHILLIPS. [The information was not available at the time of printing.]

Mr. AKIN. 2. Are you aware of an initiative to modernize the current Abrams engine in such a way that would significantly increase fuel efficiency, reducing fuel consumption by up to 17%? This improvement equates to *50 gallon per day* reduction of fuel for one Abrams tank. With the emphasis on energy efficiency it would seem to me we would want to reduce Abrams fuel consumption as fast as possible. In light of the Army's energy conservation goals, does the Army believe the Abrams Modernization program should also include fuel efficient engines?

General PHILLIPS. [The information was not available at the time of printing.]

QUESTIONS SUBMITTED BY MR. TURNER

Mr. TURNER. 1. In today's austere budget environment, can the Army afford to procure the Joint Light Tactical Vehicle (JLTV) at a base unit cost of $300–400,000 and a total unit cost of $700–800,000?

General CHIARELLI. [The information was not available at the time of printing.]

Mr. TURNER. 2. I understand the Army plans to procure about 50,000 JLTVs. How much better than the Humvee is JLTV projected to be? Will the JLTV be worth the additional cost?

General CHIARELLI. [The information was not available at the time of printing.]

Mr. TURNER. 3. Originally, when were JLTVs supposed to go into production? When are they expected to go into production now?

General CHIARELLI. [The information was not available at the time of printing.]

Mr. TURNER. 4. How long are Army and Marine Corps supposed to use these recapitalized vehicles before receiving JLTVs?

General CHIARELLI. [The information was not available at the time of printing.]

○