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EXPEDITIONARY FIGHTING VEHICLE PROGRAM UPDATE

HEARING

BEFORE THE

SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

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EXPEDITIONARY FIGHTING VEHICLE PROGRAM UPDATE

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE,
Washington, DC, Tuesday, June 26, 2007.

The subcommittee met, pursuant to call, at 4:04 p.m., in room 2212, Rayburn House Office Building, Hon. Gene Taylor (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. GENE TAYLOR, A REPRESENTATIVE FROM MISSISSIPPI, CHAIRMAN, SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

Mr. TAYLOR. The committee will come to order.

The purpose of this afternoon's hearing is to receive testimony from representatives of the Department of Defense (DOD), the Department of Navy, and the Marine Corps on the status of the Expeditionary Fighting Vehicle (EFV) program, which recently completed an extensive review triggered by program delays and significant cost growth.

The hearing will consist of one panel: Mr. David Ahern, Director of Portfolio Systems Acquisition, Office of the Under Secretary of Defense for Acquisition, Technology and Logistics; Mr. Roger Smith, Deputy Assistant Secretary of the Navy for Expeditionary Warfare; Lieutenant General Emerson Gardner, Deputy Commandant of the Marine Corps, Programs and Resources; and Colonel William Taylor, Program Executive Officer, Marine Corps Land Systems.

The program under review today, the Expeditionary Fighting Vehicle, was conceived in the mid–1990's, but its primary focus is an enduring Marine Corps mission: getting Marines from ship to shore and then helping them fight on land.

The ancestor of the EFV is the amphibious tractor or AMTRAC, first developed during World War II to get Marines ashore while providing limited protection and firepower support.

However, compared to the original AMTRAC, the EFV seeks to make a dramatic step forward. The role of this program is to build an armored personnel carrier with a 30-millimeter cannon that can launch from ships 25 miles offshore and approach at 25 knots carrying 17 Marines—a daunting technical challenge.

Building armored combat vehicles for today's combat environment, a threat that can come from any direction at anytime is hard enough. Building one that can go 25 knots in the water is an order of magnitude more difficult.

From the start of the program in 1995 until late 2006, the Marine Corps and its prime contractor, General Dynamics, appeared to be making good progress toward low-rate production in 2007. The Marine Corps and the contractors reported that the EFV prototypes were meeting all their performance goals. Congress, for its part, provided strong support for the EFV through defense authorization and appropriations legislation.

Then something apparently went wrong. Last fall, the Marine Corps program manager raised concerns about the lower reliability of the EFV prototypes undergoing developmental testing. The production version of the EFV is supposed to be able to operate about 43 hours before breaking down. The prototypes being tested were only going between 4 and 10 hours before breaking down, and there were many different systems in the EFV with reliability issues.

I want to be very clear what this kind of reliability problem can mean for Marines who operate these vehicles. Going into combat in armored vehicles that float is dangerous enough. If that same vehicle gets ashore far from the nearest maintenance support and breaks down, the Marines on that vehicle could be extremely vulnerable.

It is clear that a reliable vehicle is a must, and while I am disappointed and troubled that the prototypes performed so poorly after U.S. taxpayers provided more than $2.3 billion in funds, my concern is tempered somewhat by the fact that the Marine Corps noticed these reliability problems with the prototypes supplied by the contractor and are trying to do something about it now, rather than waiting until the vehicles are in the hands of the Marines.

After these reliability problems arose, another major decision was made by the Marine Corps, which changes the program originally authorized by this Congress. Rather than buying more than 1,000 EFVs as originally planned, the Marine Corps was directed to only purchase 573.

Obviously, when you cut the number of vehicles in half, each one is going to cost more. In this case, the cost of a single EFV went from $6 million a copy to $17 million, which I would believe would make the EFV the most expensive ground combat vehicle in the history of the U.S. military.

The combination of this dramatic cost growth and reliability problems triggered a Nunn-McCurdy review of the EFV program by the secretary of defense. The results of that review are the primary focus of this hearing. The Nunn-McCurdy review decided to keep the program going but with a four-year delay and numerous additional oversight.

While there are many important technical and financial issues involved in a major program like EFV, I am particularly concerned about DOD's decision to award another contract for continued development of the EFV to the same contractor, General Dynamics, whose poor performance led in part to the delays and cost overruns of the EFV program.

I am concerned about what kind of message this sends to the public and to those in the defense industry. An observer might reasonably ask why a contractor should get $82 million in award fees for a program that did not perform as promised and then get, in

effect, a four-year contract extension that will be worth millions more.

At a minimum, the committee expects the panel of witnesses today to address the following issues: Why does the Marine Corps need this vehicle? What is the net gain in amphibious assault capability that the EFV will provide? What happened? Why did a program that appeared to be moving along on schedule suddenly encounter serious reliability problems? Were there warning signs and were they ignored? Who was responsible for the program getting so far off track? What actions did they take to try to fix the problems when they arose?

Why did the DOD agree to let the Marine Corps keep the same contractor in place whose poor performance led, at least in part, to things going wrong? Why not run a new competition so that another company can get involved? Have lessons learned been captured, and is there a mitigation plan in place that would ensure that these problems will not occur again in the future?

Congress has an oversight responsibility to the American taxpayer. There are few programs of which I am aware that actually meet their cost and schedule goals. That must change. This committee and this Congress understand that advanced combat vehicles like the EFV represent difficult engineering challenges and are not easy to build. However, effective program oversight, sound engineering and program maintenance policies are supposed to manage that risk.

Congress cannot continue to just throw money at problems as they overrun projections. There needs to be more accountability and more openness across a wide range of acquisition projects. This is just one.

Finally, before turning to our Ranking Member, Representative Roscoe Bartlett, I wanted to point out that one of our witnesses, Lieutenant General Gardner, has been nominated by the President to serve as Deputy Director of Program Analysis and Evaluation in the Office of the Secretary of Defense (OSD). If confirmed, he will be the first Marine in this very important position.

The committee wishes him well with his Senate confirmation and new responsibilities.

I would now like to recognize the Ranking Member of this committee and my partner in trying to solve some of these problems, Representative Roscoe Bartlett.

STATEMENT OF HON. ROSCOE G. BARTLETT, A REPRESENTATIVE FROM MARYLAND, RANKING MEMBER, SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

Mr. BARTLETT. Thank you, Mr. Chairman.

Good afternoon, ladies and gentlemen.

I have followed the progress of the Expeditionary Fighting Vehicle with interest, especially because the program falls within the jurisdiction of this subcommittee. Clearly, this vehicle is a one-of-a-kind marvel. Comparisons to other ground vehicles are unproductive.

The Expeditionary Fighting Vehicle has demonstrated it can keep up with the M1 Abrams tank on land, but can the Abrams tank be launched from a ship and do more than 25 knots to shore?

Many comparisons to other amphibious assault capabilities are poor. The V–22 tilt-rotor aircraft is designed for amphibious assault, but the V–22 doesn't have a 30-millimeter cannon and doesn't protect the Marines inside from most nuclear, chemical, or biological attacks.

The amphibious assault vehicle, or AAV, that the Marines have had in inventory since the 1970's provides amphibious assault from the sea, but the AAV is over 75 percent slower and can only be launched from two nautical miles out, as compared to 25 nautical miles that the EFV has, and the AAV's range on land is 40 percent less than the EFV.

But the EFV program does have one striking similarity to a number of other Pentagon programs. It has been unable to stay on cost and on schedule. The EFV still has a number of technical hurdles to overcome. Like several of EFV's sister acquisition programs in the Navy and Marine Corps, the program is not just a little over budget and over schedule. This program is going to cost more than three times what Congress was originally informed.

If all goes well from here on out, system development and demonstration is going to take nearly twice as long as originally planned. What is even more troubling perhaps is that the reasons for the cost and schedule growth are also quite similar to other acquisition programs.

For example, at least two reviews of the program have found that there was a lack of systems engineering experience at both the government and contractor levels. Further, the schedule for the program was unrealistic, with design reviews that were held even when the contractor was not ready.

The level of effort on the program was not properly adjusted to reflect funding realities. There was not sufficient emphasis on developmental testing and the test and evaluation master plan was not properly developed.

One of the requirements appears to have been the major design drive, and consequently it was a major driver in the reliability, costs, and schedule issues. Yet at no point does there appear to have been consideration made for adjusting this requirement and spiraling an additional capability at a later date.

As well, despite these programmatic challenges, it would appear that the contractor continued to earn the majority of the award fee associated with the program. There is a disturbing familiarity here. It almost sounds like we could replace the name EFV with the name of other major acquisition programs and we would be dealing with a lot of the same issues. In this very room, we have had hearings to discuss nearly identical issues on LCS and DDG–1000. Many of these same challenges face V–22.

I have listened to our road fighters tell me that the capabilities that EFV can help fill a critical gap. I hope we will hear more about that today to assure our members that this is not simply a program that the Marine Corps feels it has to have because it is time to replace the AAV, but rather the EFV provides capabilities we need for tomorrow's battle space.

However, this pattern of cost overruns, schedule delays and apparent lack of accountability has got to stop. These are serious systemic problems. I want to hear some serious systemic answers. As

a result of this re-certification, what are you going to do to fix the specific issues encountered on EFV and what are you going to do to start re-learning this lesson?

I thank the witnesses for being with us to discuss these issues, and I thank them for their service.

Thank you, Mr. Chairman.

Mr. TAYLOR. Thank you, Mr. Bartlett.

Without objection, all prepared witness statements will be accepted for inclusion in the record.

Mr. Ahern, I understand that you have an opening statement, to be followed by Mr. Smith and Lieutenant General Gardner.

STATEMENT OF DAVID G. AHERN, DIRECTOR, PORTFOLIO SYSTEMS ACQUISITION, OFFICE OF THE DEPUTY UNDER SECRETARY OF DEFENSE (ACQUISITION AND TECHNOLOGY); ROGER M. SMITH, DEPUTY ASSISTANT SECRETARY OF THE NAVY (EXPEDITIONARY WARFARE), ACCOMPANIED BY COL. WILLIAM TAYLOR, PROGRAM EXECUTIVE OFFICER LAND SYSTEMS (PEO LS), U.S. MARINE CORPS; LT. GEN. EMERSON N. GARDNER, JR., DEPUTY COMMANDANT, PROGRAMS AND RESOURCES DEPARTMENT, HEADQUARTERS, U.S. MARINE CORPS

STATEMENT OF DAVID G. AHERN

Mr. AHERN. Thank you, Chairman Taylor. I have a very brief opening statement.

Chairman Taylor, Ranking Member Bartlett and members of the subcommittee, I am honored to have the opportunity to discuss the Department's recent Nunn-McCurdy certification of the Marine Corps restructured Expeditionary Fighting Vehicle pursuant to the requirements of section 2433 of the Title X United States Code.

Your letter of 6 June requested that OSD, AT&L, address three specific issues: a description of the Nunn-McCurdy review process; an explanation of the outcome from that process; and any initiatives the Department is pursuing to avoid similar challenges in other acquisition programs.

I have submitted a written statement that addresses those three issues, and I am prepared to further discuss how the Department addressed those issues this afternoon.

Before completing my opening statement, I would like to mention that in order to have successful execution of the certified EFV program, it is contingent upon receiving the full funding requested in the fiscal year 2008 President's budget.

I thank the committee for your time today and leadership in addressing the Marine Corps' operational needs. The committee has consistently provided our men and women in the armed forces with systems and support they need.

Thank you for your unwavering support, and I would be happy to take any questions on those issues and the other issues that you mentioned, sir.

Mr. TAYLOR. Mr. Ahern, with all due respect, I don't recall you answering a single question that we just asked you.

Mr. AHERN. Yes, sir.

Mr. TAYLOR. I hope you know that in this subcommittee, we regularly waive the five-minute rule to give our witnesses the opportunity to answer questions. This isn't for show; this is dead-serious. I want to give you a second opportunity to answer the questions that the committee just asked of you.

Mr. AHERN. Yes, sir.

Mr. TAYLOR. And do it in any manner that you wish.

Mr. AHERN. In discussing the review process and the lessons learned, I would say that we learned most specifically, the Department's initiatives focused primarily on starting the programs correctly, that we have the right balance of requirements, acquisition planning, including technological maturity, and funding. If we do that at the beginning of a program, we stand a much better chance of having that program proceed successfully.

Second, we have to have a very robust ability to frame markers for early intervention for troubled programs prior to breaches, ensuring that systems engineering processes specifically—and I think we have done that in the EFV program with the restructured schedule the way it is laid out—and contract performance management systems, and I think we have done that also with the recertification effort of the earned value management system (EVMS) of General Dynamics, and a focus on using the earned value management by the program office, that they are fully utilized as key elements in indicating the status of the program.

We are conducting a rapid review of all the major acquisitions to identify any problem programs for early attention based on our experience in this Nunn-McCurdy process in 2007. Additionally, we are working to identify the effective cost goals indicators for early acquisition program course correction, and initiatives to improve acquisition processes continue to be a department priority.

That, from the standpoint, as I understood your question, sir, addresses the questions of the lessons learned from the Nunn-McCurdy certification of the earned value management of the EFV.

[The prepared statement of Mr. Ahern can be found in the Appendix on page 33.]

Mr. TAYLOR. Mr. Ahern, we will proceed in the regular order, but I would hope that for the benefit of everyone concerned, starting with the Marines who will be riding in these vehicles, their parents, their loved ones, the taxpayers that are going to pay for these, and who have paid $2.3 billion to date for an uncompleted program, that we will get some better answers later on during the course of this hearing.

The chair now recognizes Mr. Smith.

STATEMENT OF ROGER M. SMITH

Mr. SMITH. Mr. Chairman, Mr. Bartlett and distinguished other members of the subcommittee, I thank you on behalf of our sailors and Marines to appear before you today to discuss the current status of the EFV, its restructuring following the Nunn-McCurdy certification process, and the Office of the Secretary of Defense's approved way ahead for the program.

Today, I will provide a joint statement, and I have Colonel Bill Taylor with me, our new Marine Corps Program Executive Officer (PEO) for land systems. We are going to provide the Department

of Navy's testimony on the programmatic and technological factors that led to the EFV's reliability issues in 2006, the outcome of the program's Nunn-McCurdy certification, and the restructuring and management initiatives the Department has implemented to ensure that we progress on a successful track to fill this capability.

In the interest of time, I will close by saying the EFV is the top priority program of the Department of Navy, or is a top priority program of the Department of Navy, and it is the most cost-effective way ahead as far as a restructured program, and will provide the Marine Corps the capability to perform its Title X mission of projecting combat power from the sea in an increasingly anti-access security environment.

EFV's ability to maneuver at speeds in excess of 25 knots through the water, combined with its superior land-ability, lethality and survivability, will provide both over-the-horizon amphibious capability and significantly greater warfighting power projection on land than the current amphibious assault vehicle.

I look forward to your questions.

Mr. TAYLOR. Mr. Smith, I am going to say the same thing to you. The program spent $2.3 billion. Apparently, the vehicles can't go but a few hours between major breakdowns. It is not ready to be fielded after all this money. You have just given a contract to the contractor who has apparently had serious problems. You haven't told me how you are going to redress them.

You have not done a good justification of where $2.3 billion went. As far as I am concerned, you have done nothing to promote the purpose of this vehicle, which is to make it safer for the amphibious assaults. You have to be further offshore to get the Marines to the battle safely, and then get them home safely.

The purpose of this is not to waste your time or our time, but to explain to the moms and dads and loved ones of those Marines what we are doing and to the citizens who are paying for this. Would you like another chance at answering some of the questions the committee has supplied to you?

Mr. SMITH. Absolutely. I was given the guidance to provide a short opening statement, and I will address your questions, sir.

Mr. TAYLOR. With the consent of the committee members, we think that what you have to say is important enough to where we regularly waive the five-minute rule. And so with unanimous consent, I would ask to do that today.

Without objection.

Mr. SMITH. All right, sir. Some of the problems that led to the poor reliability was that the program was not fully funded in the 1990's, leading up to deferred systems engineering. And then the deferred systems engineering that was not performed in the latter part of the program, in the systems development and demonstration timeframe, created a situation where we did not fully understand when we corrected some part of the program content from testing, something else perhaps was not addressed.

Our developmental test that was conducted did not adequately identify the poor reliability in a number of the systems. The vehicle did pass or did demonstrate all of its key performance parameters with the exception of reliability during the operational assessment. However, it could not do it consistently, as you have addressed.

We have through four different independent assessments determined that the lack of systems engineering that was not performed is one of the main factors that caused the reliability to be so poor.

Do you have anything to add, Bill?

Colonel TAYLOR. No, sir.

[The joint prepared statement of Mr. Smith and Colonel Taylor can be found in the Appendix on page 42.]

Mr. TAYLOR. General Gardner, would you like to make your statement?

STATEMENT OF LT. GEN. EMERSON N. GARDNER, JR.

General GARDNER. Yes, sir. I would like to answer the first two of your questions. First, Chairman Taylor, Congressman Bartlett, distinguished members, thank you for the opportunity to be here and thank you for your well wishes, sir.

Why do we need the EFV? The EFV is essential to the Nation's forcible entry capability, a capability that carries strategic weight in this dangerous world. Our concept of projecting power is to use a triad of Marine tilt-rotor and rotor-wing aircraft, Navy landing craft air cushions, LCACs, and the EFV, to achieve speed and sustainable power ashore. Without the EFV, the United States does not have the ability to conduct surface assaults from ships over the horizon.

The necessity of over-the-horizon operations was reinforced about a year ago when Hezbollah rebels used an Iranian missile to successfully engage an Israeli patrol boat about ten miles offshore of Lebanon. If we Marines were told today to perform our primary mission of forcible entry from the sea, Navy ships would have to operate well within the range of those kinds of coastal defense. Rapidly acquiring the EFV will reduce the risk of casualties and the loss of ships.

I believe that answers your question, sir, about the need and the net gain in capability.

We believe that the acquisition community within OSD as represented at the table today has restructured the EFV program in a way that will give us the high-speed amphibious capability that we need. As the final piece to our long-sought triad of forcible entry capability, we seek the support of the Congress in fully resourcing this program in fiscal year 2008 and the years to come.

Thank you.

[The prepared statement of General Gardner can be found in the Appendix on page 51.]

Mr. TAYLOR. Thank you, General.

General, the first question will be, how practical is it? It seems to me it would be great to have a vehicle that can do 26 knots in the water speed with equal survivability. But how practical is that to couple with a vehicle that is going to go several hundred miles inland?

And the next question is, given the enemy's unfortunate exploitation of the Humvee, and their continued improvements in the use of mines, particularly from below a vehicle, how well protected is this vehicle if we solve the technical problems on the breakdowns? How vulnerable will it be to mines from underneath? And is that being taken into account?

Nowhere have I read that that was one of the initial goals, and that is forgivable because we didn't see this coming with the Humvee. We didn't see it coming with the Bradley. South Africa saw it ten years ago, but we, is the word, did not see this coming. But we see it now, and we are taking steps with the Mine Resistant Ambush Protected Vehicle (MRAP) now.

So what steps are being taken, once we solve the mechanical problems and the breakdown problems, how susceptible to mines from beneath will this vehicle be? And has that been a part of the testing?

General GARDNER. Sir, let me try and take those in order.

First, you know, the Marine Corps is a balanced force. We are a multi-mission force, and we have to be organized, trained, and equipped to do a multitude of missions. This is one of the reasons that we embarked on looking at our portfolio of armed vehicles here and reduced the overall objective from 1,013 EFVs to 573.

At the same time, we decided to balance our portfolio by seeking in the future about 600 or so wheeled vehicles, armored vehicles, which will then together provide the kind of capability you would need ashore, but still provide us this forcible entry capability from the sea.

So I would say that the EFV provides this niche. It is the only machine in the world that provides that capability, so zero is clearly the wrong answer. As we looked at the mission sets and what we saw in the strategic planning guidance, we felt that 573 was the right number to properly equip and position assets on prepositioned ships, and in training assets.

So I think that goes after what you are talking about, is it practical to do that. We need that capability. When we are standing offshore from the forcible entry requirement, we need the ability to go both air and surface, or some mix, according to the situation at the time, and this provides that.

With regard to the protective capabilities, I think maybe Colonel Taylor or Mr. Smith is maybe better postured to answer the specific attributes of the vehicle, but we recognize that there must be certain trades made when you are trying to get all of these capabilities to provide the overall capability to the Marine Corps.

To provide this kind of high-speed capability that we need to be able to get up on plane, we need a flat-bottom vehicle, and flat-bottom vehicles are not ideally suited for damage control against buried mines. However, the side protection of the vehicle does provide the kind of force protection that we are seeing in the vehicles today.

Perhaps Colonel Taylor——

Colonel TAYLOR. Yes, sir, Mr. Chairman. Again, as General Gardner mentioned, this is sub-optimized as compared to some of the pure combat vehicles once ashore, but because of the requirement to have that flat bottom so that it can get up on plane, that is a driving factor in being sub-optimized. But even once ashore, it does compare favorably to purely ground-based combat vehicles such as Strykers. So it does satisfy its firepower, armor protection KPPs.

Mr. TAYLOR. About two years ago right now, one of your AMTRACs out in Anbar Province, with a number of Marines on board, was attacked by an extremely powerful device from underneath.

Some of the Marine Corps reservists on that AMTRAC were from Mississippi. They were a bit more fortunate than their counterparts from Louisiana Marine Corps Reserves. That certainly left a lasting impression on a lot of people in that part of the world.

If this vehicle were to encounter that same device, number one, has anyone run any tests like that? And I guess the follow up would be, if a test has been run, would it be any more survivable than that AMTRAC was on that day two years ago?

Colonel TAYLOR. Mr. Chairman, I think I would answer the question in this context, that this is a common risk area, and has to be addressed in the Science & Technology (S&T) environment from a common perspective. This is not purely an EFV concern. So EFV has not done any dedicated testing to date.

Mr. TAYLOR. Colonel, believe me, I respect you. I respect your profession.

Colonel TAYLOR. Yes, sir.

Mr. TAYLOR. But we are today operating AMTRACs hundreds of miles inland, because there is a riverine environment where you occasionally, because of bridges being either suspect or gone, have to have those capabilities. I understand that. I also understand that we have an adaptive enemy who has been learning, unfortunately pretty quickly, as he goes along.

If that vehicle were in production today—let's say we fixed the mechanical problems—so if that vehicle was in production today and was traveling in Anbar Province or anywhere else in Iraq, and encountered the same explosive device that the AMTRAC did a couple of years ago, what would be the results? Has that been tested?

Believe me, I understand the production for this—I mean, the faultline on this started in 1996. That was a long time ago. I appreciate the huge technological challenges, but if we don't address this now, shame on me and shame on all of us.

Colonel TAYLOR. Yes, sir. To the best of my ability, I will answer it in this fashion. It has not been addressed on the EFV, but it has not been addressed any better on any other vehicle at this moment in time, but we have to get there.

Mr. TAYLOR. Well, given the Marine Corps' crash program, and I respect that crash program, to try to field an MRAP, because of what we have seen happen to the Humvees and other flat-bottom vehicles, why isn't this being looked into? The program is already behind schedule, so if we are going to build it, and if the Marine Corps tells me they still want it, I want to work with you to build it.

If we are going to build it, why don't we build it in a way that would make it more survivable to a threat that we didn't know existed ten years ago—should have known, but didn't—but we certainly know exists now?

Colonel TAYLOR. Yes, sir, I will take as an action to see what is being done.

Mr. TAYLOR. Do you mind if I turn to your left?

General GARDNER. Sir, I would just say that in a sense of the penetrating capabilities of underbelly mines out there, we are somewhat limited by the flat belly, but there are things that have been done to the EFV that make it more survivable in any kind

of incident than the current IED out there—an improved fire extinguishing system; spall liners—these sorts of armoring things out there do make the vehicle more survivable today on the battlefield, that same vehicle today out there.

Now, where that particular mine went though, I cannot sit here and testify that it would not penetrate, it would not cause injury and death. But I do feel that we have done everything else within the capability of the vehicle to put in the kind of survivability—things like fire extinguishing capability. You can help me out here maybe with general capabilities, those sorts of things.

Mr. TAYLOR. I understand the need for a lifting body. I understand buoyancy, but you can also get a lifting body with a V-shape. It is a bit more difficult. It actually makes the vessel more seaworthy, and it certainly would make it more survivable to an attack like that.

So my question is, if we are this far behind schedule; if we are looking at other things, why aren't we looking at that as well? Because I would hate to rush to production a vehicle that within several months, 60 Minutes, and moms and dads all across America are saying, "What in the heck are you all doing? Why did you send my child to battle in something you knew had a flat bottom, when you are in the process of replacing every Humvee in-theater for the Marine Corps?"

General GARDNER. Sir, I would just submit that my understanding of what the ability of industry is to produce and the capabilities out there, and the various threats which continue to evolve and challenge us even in the MRAP program, that we have to balance risk as well as we can against mission capability. We are probably not going to have every vehicle at every time going to have an equal amount of force protection to the most armored of vehicles.

Of course, that would be a laudable goal to get there, but technologically we need those kinds of science and technology efforts that Colonel Taylor mentioned. We believe that there is some balance of risk that takes place if you are going to achieve some of these niche mission capabilities.

Mr. TAYLOR. Okay. Did any of the proposals, either in the beginning or more recent proposals for this program, include a V-shaped bottom?

Colonel TAYLOR. I am not aware of any, sir. I believe that the physics would then preclude you from being able to achieve your high water speed KPP with a V-shaped hull.

Mr. TAYLOR. Again, I respectfully disagree. It would make it more difficult. You are not going to get the kind of lift. They build V-bottom boats every day all across the country that achieve great speeds.

The chair yields to Mr. Bartlett.

Mr. BARTLETT. I am interested in totally understanding why making it V-bottom would make it less like a boat. Most boats I am in do have a V-bottom. I think properly designed, that shouldn't be inconsistent with our goal of high water speed, should it? Because every boat I have seen going fast on the water, has a V-bottom rather than a flat bottom. Am I correct?

Colonel TAYLOR. Yes, sir. I believe it comes down to the weight and torque ratio. I really believe it has a lot to do with the existing

vehicle's ability to get up on plane. That is what allows it to achieve that last percentage of high-water speed, once it gets up on plane. Without getting up on plane, this vehicle right now tends to wallow down in about the 14- to 17-knot range.

Mr. BARTLETT. Almost everything we do is the result of some compromise. I agree with the chairman that this newfound vulnerability in the Humvee would appear to necessitate a look at this vehicle to see if we couldn't build into this the kinds of protections that were not in the Humvee, that we are now moving to the MRAPs to get.

This vehicle clearly provides the Marines with the capabilities that we do not now have. In deciding whether this is a must-have or not, we need to look at this requirement as compared to many other requirements that we have. It has been a long while since the Marines en masse stormed a beach, hasn't it?

General GARDNER. That is correct, sir.

Mr. BARTLETT. Of course, this could be used for a very small group of people. I understand that. It has been a long time since we en masse stormed a beach where this would be an ideal vehicle, of course, particularly in the numbers that we are anticipating buying.

If you knew of all the problems that we were going to have in developing this vehicle and in looking at all of the other needs that the Marine Corps had, if you knew before we started this, where we would be today, would you have started? Or could this money have been spent better in some other area?

General GARDNER. Sir, we need the ability to mix our force lines capability by air and surface, to have that surface capability. If the threat has driven our ships over the radar horizon, significant distances from the coast, you have to get there. If you are going to get there from the surface, then we need some sort of surface craft to do that.

We think this is an essential capability. I think that we would still take the same decision. Obviously, we would not want to see the program structured as it has been and performing as it has been. Hopefully, we are past that with this restructuring.

To your point, sir, about the Marines not storming the beach in a long time, there are many capabilities that have not been used that are essential to our Nation's security. There is a significant deterrent capability in the knowledge of people around the world that the Marine Corps has a viable forcible entry capability. We would agree that we don't need too much of it.

Once again, I go back to the mix of vehicles and getting the right number so that we have a viable operationally significant number of Marines that we can do in this manner. That is how we arrived at the 573 number. This would support surface assault of about two Marine expeditionary brigades, and in each expeditionary brigade, about 15,000 Marines—so the surface portion of that initial assault.

So that capability we think out there has a certain deterrent value, and was clearly used in the first Gulf War, and is frequently assessed as having pinned down a significant number of Iraqi divisions, even though non-employed in the liberation of Kuwait, as an example.

Mr. BARTLETT. I have a question about the number of vehicles. When we thought it was going to cost $5 million, we needed over 1,000. When we learned it was going to cost a whole lot more than that, all at once we need about half that number. And so one wonders about the analysis that is used in arriving at the number we need.

One last question, and this is a problem that existed in many, many programs. Apparently, the real cost driver here was our desire for high water speeds. That made it a very complex, costly and potentially unreliable and difficult to maintain vehicle. When we are designing these capabilities, is there anybody at the table who is asking when is enough enough?

There are many of these designs that in spending 50 percent of the money, you can get 95 percent of the way there, but that last five percent will cost as much money as the first 95 percent. If we just accept the 100 percent as a requirement, and nobody said, gee, could you really make do with a little bit less, which will cut the cost in half—is there nobody at the table that does that?

Because so many of these programs, Mr. Chairman, are driven because of a requirement that if we had been able to reduce it just a little might have massively reduced the cost and complexity and kept it more reasonably on schedule and on-cost.

Who sits at the table to make these arguments?

General GARDNER. Sir, as part of the Nunn-McCurdy certification process——

Mr. BARTLETT. But this is after the fact, sir. Who sits at the table when we are designing these things and you are telling us how much they are going to cost? Who sits at the table asking these questions?

Mr. AHERN. I can address that question. I think that the requirements and the program management together—the acquisition and the program management.

I am not going to say that we have had a great tradition of doing it well, but the recognition that cost and schedule are flexible variables that we can get more of all the time is no longer part of our way of doing business. There is in every acquisition summary of the program a statement of what the technological drivers are for cost in that program, and we look at those every month.

Further, as we begin programs, as I mentioned in my opening statement now, we are very sensitive to the effect of pushing requirements against cost and schedule. We have a requirement to check technological maturity, as well as integration maturity, before we go forward on birthing a program.

Finally, specifically in this program, Mr. Krieg has encouraged us as we go forward in this reliability development portion of the program, to recognize as we get to key reviews—the preliminary and the critical design review—that we can and should address whether we are over-required and need to tradeoff requirements in order to have, as you said, sir, the 85 percent or 90 percent solution, rather than spending that inordinate amount of money and schedule to get that final 10 percent.

I think the department has that message now, that cost and schedule are variables that we must look at and performance has to be looked at at the same time.

Mr. BARTLETT. We just underestimated——

Mr. AHERN. I think that in this particular area, and I think that that was commented on before—this particular program, similar to many other programs, the complicated nature of the technology, the expectations of particularly the waterborne speed, and the integration effort that was going to be required, was not as well understood as it needed to be.

The analogies that were used in the initial costing in the middle–1990's were to programs that were available at that time. I couldn't go into which one of the programs, but I am comfortable from going through this process that they didn't have the analogies that were accurate to do the cost estimating in terms of the complexity and the technological effort that had to be made.

And so that cost estimating turned out I think to be a significant portion of it. As Mr. Smith commented, then we needed to have more robust systems engineering, and up front an early developmental testing, which I think we have in the restructured program, to show us whether or not we are on the track—and that is the way this restructured program is developed. Instead of being as schedule-driven, as Chairman Taylor mentioned, it is an event-driven schedule, with an expectation that we will carefully review it at each episode.

So in summary, to answer your question, I think it was technology, cost-estimating connection there, and the integration, and then the fact that we didn't put the system engineering in to begin with to make up for those. Then we had a more schedule-driven than an event-driven program.

Mr. BARTLETT. Thank you very much.

Thank you, Mr. Chairman.

Mr. TAYLOR. The chair recognizes Mr. Courtney.

Mr. COURTNEY. Thank you, Mr. Chairman.

I am still trying to understand what the change is going to be after the review. You were starting to describe a different process. Maybe you can just help me, as one of the new guys here. What does that mean?

In terms of what we were given, award fees were given out during the 1990's and early 2000, in a process which clearly was a mistake. I mean, it definitely seems that this process was not working, if there were actually award fees given out. What is going to change so that we are not going to see that type of mistake made again?

Mr. AHERN. Yes, sir. I would like to address the award fees specifically, but only for a minute, and then I would turn it over to Colonel Taylor or to Mr. Smith.

First off, I think that the award fees, the way they were structured in the 1990's and in the beginning of the 2000s, were less objective and measurable than they needed to be, and that has been recognized by the department. About three or four months ago, a new directive came out on the criteria for developing award fees, for writing award fees.

I think that the contract—and of course, the award fee plan is a part of the contract, and that I where I will defer to the Navy, and I will quit right now—that there were problems with award fees earlier.

And in the specific case of this one, I would let the Navy answer it—but that has definitely been addressed, and there is absolutely, again as with other things that we have learned, not only from the Nunn-McCurdy, but just other events in the department. We reissued a varied directive not only on award fees, but that ties into objective, measurable events.

Mr. COURTNEY. And so let's say as event progress or develop, and the Pentagon determines that it is not working or it is not satisfying what the taxpayer is looking for, what happens?

Mr. AHERN. Those are described, and again I could defer to Colonel Taylor, but I want to say, because I was heavily involved in the certification, there are off-ramps described—"off ramp" meaning go do something else, or we need to look at this program very hard—three separate off-ramps before we get to a low-rate production decision. Again, the award fee is very definitely based on an objective and measurable criteria.

Mr. COURTNEY. Does an "off ramp" mean cancellation?

Mr. AHERN. It is a possibility, yes, sir—measurable criteria for those events that if not satisfied require a real hard look, and that is certainly a possibility.

Mr. COURTNEY. Okay.

Colonel TAYLOR. Mr. Courtney, let me try and give you some additional insight into the award fee. Historically, most developmental contracts are in fact cost-plus award fee. That is no excuse. It is just a statement of fact, probably a lesson learned. You are correct in that General Dynamics earned $82 million in award fee payments of a potential $103 million. Another way to look at that is they failed to earn $21 million in award fees.

Additionally, historically award fee payments are probably up around 14 percent or higher. There was only an available 11.5 percent opportunity and General Dynamics only earned 8.1 percent. But you could say, okay, they earned 8.1 percent for bad behavior. Noted.

What have we done to try and improve this? First of all, here was the award fee criteria associated with the cost-plus incentive fee contract. Forty percent of it was given for just the objective attainment of cost performance index (CPI) and scheduled performance index.

So for instance, if they only achieved a .09 on CPI, they still got 90 percent of that 40 percent. And then 60 percent was technically oriented, but a subjective criteria. So it was more a focus on program risk areas at a given point in time, rather than objective and tied to critical path events.

So what have we done to perhaps address the taxpayers' concerns? On the 15th of June, we modified the existing contract and we will follow suit in the follow-on contract and award a cost-plus incentive fee.

What has changed? We have designed very discrete and objective criteria that is tied to program critical path events—technical reviews. And we have assigned very specific exit criteria. General Dynamics must achieve the exit criteria at these technical reviews or they get nothing.

So in essence, Mr. Ahern mentioned three decision points. These new toll gates associated with technical reviews add an additional

three to four toll gates for a total of as many as seven prior to the milestone decision. Those are very discrete events and the award fee is back-loaded, as opposed to previously where as long as they achieved up front in terms of CPI and SPI, it was front-loaded.

Now, you take three of the key technical reviews, it is back-loaded. So the most critical one, critical design review, is the point at which they must prove that they can meet the reliability with the new design that is 50 percent of the award fee. So it is all or nothing—50 percent at that point in time.

And then backing off from that, there is an SFR review where they can gain 30 percent, and an SSR where they can get 20 percent. But it gets more difficult as the program progresses for them to earn award fees, and it must be very black and white. It is objective. They achieved the exit criteria or they did not.

Mr. COURTNEY. The other question I had is, General Gardner, congratulations on your appointment. You described again the need for this type of vehicle in terms of some scenario that could develop in the future. If that need popped up today, or in the near future—I mean, obviously we are still a long ways off of these vehicles being available—what would the Marine Corps use?

General GARDNER. Yes, sir. We would have to use our amphibious assault vehicles, AAVs, that we currently have, which are displacement vehicles and operate—ships come in close to the beach, 5,000 yards off the beach; push the vehicles out and they go ashore at somewhere around five knots or so. Hence, they have to go in pretty close. Then you are taking risks with those ships to come in that close.

So the Marine commander has to persuade the naval commander that he needs to take that risk with those ships to push those vehicles out. The naval commander will obviously push back on that and will not want to do that, and will try and persuade the Marine commander not to have a surface assault capability.

There are situations where you need that surface assault capability. You cannot just do it by air. And so, it presents us with a dilemma today, and this is a situation that the commandant is concerned about, that we are putting our naval commanders—we are forcing them to make this sort of risk decision.

Mr. COURTNEY. Thank you.

Thank you, Mr. Chairman.

Mr. TAYLOR. The chair recognizes Mr. Ellsworth.

Mr. ELLSWORTH. Thank you, Mr. Chairman.

Thank you, gentlemen.

I am not sure who the best person is for this first question, but this vendor on this particular vehicle has been around a while. They are not a brand new company that has just gotten into the business of military supplies. Is that correct?

Colonel TAYLOR. Yes, sir.

Mr. ELLSWORTH. It is your experience that—and I will go ahead and say it—General Dynamics has provided in the past good equipment that works, that has come in on time and on budget, ever in history?

Mr. AHERN. *Virginia* class, I think, sir, is one recently. Of course, that is not the land systems group. That is Electric Boat up in

Groton, Connecticut. That is one example that I believe is on track now.

Mr. ELLSWORTH. They have done good things for our country and our military.

Mr. AHERN. Yes, sir.

Mr. ELLSWORTH. I would agree with that.

Mr. Smith, there was something I would like to go back to. You talked about the fact that this program was not fully funded, and then you said—and I missed it; it was my fault—the third "blank" engineering.

Mr. SMITH. That caused a deferment. The lower funding levels caused a deferment of the systems engineering that would normally be done in a later period of the systems development and demonstration of the schedule, and that is what I was trying to articulate.

Mr. ELLSWORTH. Okay. I was just reading this document, and one of the tables talked about it being underfunded by at least $400 million, resulting in design shortcuts and inadequate testing. That really concerns me, that if this company, obviously a price when you sign a contract for anything it is both sides agreeing on a price of what they think that will cost. If you get into that, then I would expect, and it looks like—and that will come in another question—that the company should have come and said this just isn't enough money.

It appears from this chart that when they got into it and because they were underfunded that they took shortcuts on a vehicle that is going to, like I said, design shortcuts on a vehicle that we are putting American soldiers in. I cannot believe that this company and we would accept that we are taking design shortcuts that are, like Chairman Taylor said, to put our troops in a vehicle because it was underfunded.

That is a huge concern. I don't know if you want to respond to that or not, but that is probably my biggest concern, that they would willingly do that based on their funding. Or is it that for $400 million less, did we take the C-team engineers to design this at the company, because we are less? Or are they all paid the same? I am stuttering because I am shocked, I guess.

Mr. SMITH. Let me see if I can offer a few comments in response, sir, to help you understand perhaps a little bit better, and for the other members. We did four different independent reviews, and in part of the Nunn-McCurdy review process, there was a big management review, both of the government management structure and of the corporation's management structure.

General Dynamics Amphibious Systems, which is co-located with the EFV Marine Corps Program Office down at Woodbridge, Virginia, in some instances was divorced from General Dynamics Land Systems corporate knowledge base. Their systems engineering capability did not matriculate down. And also because it was a separate geographic location, we determined that some of the management perhaps did not pay as much attention to the oversight within the corporation.

As well, there is enough I think to go around here, the EFV program management in the Marine Corps because it was in ACAT 1D, an acquisition category 1D program, it did not have a typical

program executive officer structure that the Navy and other services have. It was a direct-report program manager to the acquisition secretary in the Navy. And I don't know how long, but it was a long time—at least since inception.

As a result, because of that lack of professional type of flag or very senior acquisition professional officer oversight, some of the hard questions and some of the hard reviews were not performed. That is one of the reasons that both the assistant commandant of the Marine Corps and the acquisitions secretary of the Navy have selected Colonel Taylor, who was part and parcel in really getting the MV–22 program back in the air successfully, and selecting him as the program executive officer now.

So with the new management structure like that in place, it will be much more rigorous oversight from here on out. That is one of the EFV success points that we are trying to achieve as a way forward. So hopefully that answers you. It is a roundabout answer, but hopefully it answers some of your questions.

Mr. ELLSWORTH. Mr. Chairman, did we waive the five minutes?

Mr. TAYLOR. Absolutely.

Mr. ELLSWORTH. Okay. I just wanted to know if I need to skip a couple of questions.

One of you said—and I don't know if it was Mr. Ahern—I am not sure if Mr. Smith said that we could look at this a different way. Maybe it was the Colonel. That on the bonus, the $82 million bonus, that we could look at it in a different way, that they got cut 21 percent because they didn't deserve the 21 percent.

In the list I am looking at in a chart in here, and going on a list of failures, is there a laundry list somewhere of the 79 percent that they did receive of good things that this vehicle does? I mean, are you convinced that they deserved the 79 percent of that $82 million? Where is the laundry list of good things about this? How many of these vehicles are actually operational right now?

Colonel TAYLOR. We haven't reached IOC yet, but there are nine prototype vehicles operating out there.

Mr. ELLSWORTH. Is there that list we can look at that says, "Here is why they deserved the 79 percent"?

Colonel TAYLOR. I think I would stop short of saying they deserved it. They were legally entitled to it by virtue of achieving the terms and conditions of the negotiated contract, whether right or wrong. And I think we have taken note of your concerns, and like I mentioned previously, we have completely modified the existing contract to try and take a more prudent approach to the award fee.

Mr. ELLSWORTH. I understand. I was a county official before, you know, five months ago and was in on some contracts. Even in the election, I made contract offers for a win bonus, but you had to win for that group to get their bonus. I am building a new jail. We had things built in, but it was at the completion. So I understand that.

I just think the American people expect the Federal Government—we have been around a while—and that we would do a better job when we supply equipment to our military that if it is good enough for the feds, it is great. So I am just a little disappointed sometimes when we get into this situation.

I guess my last question is, and this was spec'ed out at $6.2 million apiece in 1995. Is that accurate, according to the documents?

Colonel TAYLOR. It was $6.7 million.

Mr. ELLSWORTH. Okay.

Colonel TAYLOR. And in 2007 dollars to baseline, your comparison, it was about $6.7 in the original contract award back in 2000, as a starting point.

Mr. ELLSWORTH. And now they are back to $16.9 million in 2008 dollars?

Colonel TAYLOR. In 2007 dollars, yes, sir.

Mr. ELLSWORTH. In 2007 dollars, and this contract is supposed to go until 2025? I mean, can you tell me what is—that is pretty drastic.

Colonel TAYLOR. We are actually only on the development contract right now. The actual production contract, there is an LRIP contract planned for 2011, if all goes well. The full rate production decision will be in 2015, I believe. Right now, we are strictly working with the development contract.

Mr. ELLSWORTH. In the contract, was there a percentage that the company, the vendor would give us a range, a top-end of what this could go to per vehicle, due to steel, due to electronics, capital, whatever it might be—it could vary between this and this so we know what the top end could be?

Colonel TAYLOR. Sir, that is actually the job of the CAIG estimate, and working with their cost curves. It is really a band and a confidence level.

Mr. ELLSWORTH. It just seems like a huge—a huge—gain over those years. I know there is inflation, but——

Colonel TAYLOR. The majority of that, it is nearly double the original estimate back in the 2000 timeframe, and was based on what Mr. Ahern mentioned earlier—estimating analogy errors. Essentially in retrospect, I think they would have been better off comparing the complexity of this vehicle to an aircraft instead of the legacy combat vehicles that are much more simplistic designs. I think that was a failure in the estimating.

Mr. ELLSWORTH. In closing, I thank you. I know this is not a fun hearing for you. It is not fun for us. I would ask that we learn from this and give the public more of what they deserve. They may not expect perfection from any of us, but they expect and deserve a little bit better than this. So I would like to thank you all for your testimony.

I yield back, Mr. Chairman.

Mr. TAYLOR. Thank you.

Mr. Ahern, I am curious. You touched on the varied requirements of this vehicle. One of them that really caught my attention was that the vehicle could launch in two-foot seas 25 miles from shore.

Now, I just had an opportunity to visit with Captain Ebbs, who retired from the United States Navy, a captain, and asked him a couple of scenarios. How often would he see two-foot seas 25 miles off the coast of Korea? Or off the coast of Taiwan? Or on the Persian Gulf? He felt like that was an extremely small percentage of the time.

So given that, number one, I certainly wasn't there, but I have seen the videos of D-Day, those Hades boats launched in significantly higher seas than that. How realistic an assessment was

that? And you were only counting on a breeze from shore? Again, I think it would be fairly rare that you are having an off-shore breeze 25 miles out at sea. I don't think that is going to happen.

So even if it failed to meet the goals that you set out to meet, and even those, in my opinion, were unrealistically low.

General GARDNER. Sir, at the risk—I will take that on, on the requirements, with perhaps just a comment here.

We have talked the last few minutes here about something that we see as sort of the iron triangle as we procure material capability, of requirements, resources, and acquisition. Instead of doing this literally where the requirements people, the Marine Corps figures out exactly what they need; go to the resources people; go get the money; and then go give it to acquisition and just patiently wait.

We are working at this more like a triangle now in which there has to be flex on the sides to achieve the objective. I think that gets to a little bit of what Congressman Bartlett was talking about, who is responsible here. On the requirements, we did a detailed scrub of the overall review as part of this process, just a bottom-up. I will be asking for more capability here than we need in any area.

Mr. TAYLOR. General, I think you are asking for less capability. I am told that the shores of Normandy, that the bottom of that water is full of what was supposed to be tanks that would float and swim their way into shore, and failed and killed the crews. I sure as heck don't want to repeat that mistake.

General GARDNER. The direct answer to your question, sir, what we are talking about is significant wave height, not seas per se, the sea-state. I fear treading here, so I was talking to a former Coast Guardsman about seas, but sea-state and the seas and the swells—we are talking about the significant wave height which is the seas above the swells—so it is that two to three feet that we are talking about.

We have assessed that the impact of reducing from a three-foot significant wave height to two-foot significant wave height, probably we would encounter the difference between those seas about seven percent to 16 percent of the time in various places around the world, depending on where it is and the time of year. There is a chance where you would not be able to do a mission because you had chosen this.

The reason we went down this road was to try and achieve, to ensure we are not asking for more than we could actually use. We are talking about the physics of moving ashore with this vehicle. This is not an LCAC that transits back and forth to the beach routinely. Its primary mission is to go from ship to shore. It is not really practical to take the EFV and slam into head seas at significant weight in there. It is too many Gs on the troops inside, on the passengers in there.

So it is like a driver of an EFV, as we examined this requirement, it would not do that. We have to go to great lengths to find seas of that nature that provide this three-foot significant wave height above the swells to even test the vehicle to that. And then when we find that, you set up the Gs and do this—and probably somebody can talk to the actual tests that are taking place. It is not something that the troop commander would do.

So we felt that this was an area that we could take risks and provide some weight margin to the program manager so that he could then design in components to improve the reliability of the system. So this is where I get to on this triangle of making the adjustments.

We did the same thing with regard to tactical reach. The requirement at one time previously was 25 miles ship to shore, and then go 200 miles inland. What we said is, once we go 25 miles ship to shore and operate in an initial assault, we don't need to fill the tank up with 200 miles worth of gasoline, with fuel. We will fill it up with 100 miles.

At that, we could take that risk and operate. The vehicle still has the ability to go 345 miles while ashore if it is a land-assault-type environment. And then we removed a smoke grenade launcher that we felt was never really used in operational scenario.

So combined, what we did was try and find are there things in here where we were asking for more than we would practically use. The analogy that I have kind of thought this true, and I hope I can use it here, is that it is going to a car dealership and having a car that can go 100 miles an hour, and he tell you, yes, well, if you just buy this spoiler and put it on here, it can go 100 miles in an ice storm.

Well, yes, but why would I want to pay extra money to put that spoiler on there to go do that? I wouldn't drive 100 miles an hour in an ice storm. So that is sort of the thought process behind the reduction in significant wave length from three feet to two feet.

Mr. TAYLOR. General, I am less than convinced with the answer, with all due respect. If you have only got a platform that can be launched 18 percent of the time safely—and again, this isn't from me, this comes from Captain Ebbs, who spent the better part of his life at sea—in the scenarios that are likely and foreseeable, that just doesn't make sense.

General GARDNER. No, sir. It is a reduction in——

Mr. TAYLOR. If I may, sir? The V-hull that would make the craft more survivable in the event of a mine would also make the hull ride better in a heavy sea. That is simple fact.

I am concerned that you still continue to have mechanical problems after $2.3 billion of the taxpayers' money. You have nine vehicles to test that break down way too often. I haven't heard anything today that gives me any degree of confidence that you are addressing these problems. So let's walk through this hopefully so that I can understand this.

How does the Marine Corps handle a program like this? Do you take an officer and say, "It is your job to make this work; I want you to ride that contractor, find out what the problems are and solve them and report back to me"? How does this work, and what is the rank of that officer? How long will he have that job? Is that his career billet or is he pulled out of combat and stuck in this for a couple of months and then pulled back into combat? How does that work for the Marine Corps?

Because, General, again, this is not something unique to the Marine Corps. We have problems with the littoral combat ship. We had problems with the Deepwater program in the Coast Guard. What we are trying to do is see to it that we don't keep making

the same mistakes. So I am curious how the Marine Corps handles this now.

General GARDNER. That is the defense acquisition specialist, and he may want to answer the question, sir. Please go ahead.

Colonel TAYLOR. I will at least attempt to get started here. It has its genesis in the Defense Acquisition Workforce Improvement Act. It specifies very stringent qualifications training, experience—years of experience——

Mr. TAYLOR. Again, with all due respect, we are going to have votes any minute now. Tell me how the program works right now. Don't give me the script that I would read in a DOD manual. In terms that this committee can understand that you would be telling a friend over a cup of coffee, how does this program work within the Marine Corps?

General GARDNER. Sir, because the program has been——

Mr. TAYLOR [continuing]. From the uniformed Marine side.

General GARDNER. Yes, sir. Because the program is an ACAT 1B program, the defense acquisition executive is the acquisition executive for the program.

Mr. TAYLOR. And his rank is what, sir?

Colonel TAYLOR. That is Mr. Krieg.

Mr. TAYLOR. Who do you have in-uniform who would really understand with a sense of situational awareness what this vehicle is needed to do? Who do you have in uniform that has been there, can envision this, that is following the program?

Colonel TAYLOR. The program manager is the rank of colonel. He is fully qualified from an acquisition perspective. He also has lengthy combat experience and combat vehicle experience as an operator.

Mr. TAYLOR. And his name is?

Colonel TAYLOR. Colonel John Bryant. He is the program manager.

Mr. TAYLOR. How long has he been the program manager?

Colonel TAYLOR. He has been the program manager since last fall, I believe September.

Mr. TAYLOR. And under the normal routine, how long would he be the program manager?

Colonel TAYLOR. Four years, sir, or the next milestone.

Mr. TAYLOR. I am curious, why isn't he here today?

Colonel TAYLOR. The letter requested specific attendance.

Mr. TAYLOR. Okay. If I could, I would like to request, General, that we have a follow-up in a briefing forum—whatever you are more comfortable with. I think given the severity of the perceived problems that it would be beneficial to all involved to get him here.

Colonel TAYLOR. Yes, sir.

Mr. TAYLOR. So keep going, sir. So you have a colonel?

Colonel TAYLOR. Above the program manager——

Mr. TAYLOR. And he is going to be doing this for four years.

Colonel TAYLOR. Yes, sir.

Mr. TAYLOR. So he sees a problem. He sees a problem with mechanical breakdowns. He sees a problem with unreliable hydraulics—any number of things. What does he do then?

Colonel TAYLOR. I would like to approach it from a different perspective, sir. The way that the restructured program is laid out, he

is pulled from one of the books of acquisition doctrine and system engineering doctrine, and he has applied to the program what I haven't seen in the past, which is knowledge points.

He has built in five knowledge points into the program, which are benchmarks at which point the contractor must meet specific reliability criteria, either from a predicted standpoint or a demonstrated standpoint, or based on modifications, lessons learned because of underachievement—another knowledge point is predicted.

Ultimately, the end-state, the last knowledge point, should give you absolute confidence before it goes into IOT&E, the final exam, that you can in fact achieve the reliability KPP before you actually go in to test. It is a very disciplined process that I haven't seen used before.

Mr. TAYLOR. I understand it is a disciplined process, but we can also see times when the requirement didn't really fit reality. I think a two-foot sea-state falls into that, 25 miles offshore—it is one of them. It slaps me in the face that that is not realistic. Okay, so does this colonel who has combat experience, who is responsible for the lives of other Marines, does he just sit back and say, well, that is not the requirements; I won't look that way?

Colonel TAYLOR. No, sir.

Mr. TAYLOR. All right, when he sees something that he knows to be wrong, what does he do?

Colonel TAYLOR. The acquisition benchmarks become triggering mechanisms if at one of those knowledge points he believes he is not on the reliability growth curve that will ultimately achieve the reliability KPP at IOT&E. We turn to the requirements community and ask them to assess additional trade space.

General GARDNER. The requirements, sir, are significant wave height, not sea-state. I want to make that distinction. Because this is an ACAT 1B program, that was a key performance parameter, that is a JROC-held requirement. So once we develop the idea that there is some trade space here in these requirements, that was staffed through the Marine Corps operational concepts thing, and then put into the joint process, and was approved by the JROC as certification of that process, of the requirement.

That requirement, then, the acquisition community then seeks to fill that requirement. The Marine Corps then at that point, you know, we are here to support the acquisition community in terms of seeking resources from the Congress and ensuring that our requirements are understood. If they are not there, then we need to look at examining those.

Mr. TAYLOR. General, let's go back to the issue—and, again, it is something I didn't see coming, should have seen coming. We spent a lot of money to up-armor Humvees to have a vehicle that is susceptible to a blast with a bottom. I say that in that I don't want to keep making the same mistakes. You are doing the vehicle with the flat bottom. You have people with combat experience who have seen Humvees blown up in Iraq.

Did anyone along the way say maybe we ought to re-think this before we go into full-scale production as far as the bottom of this vehicle? And if not, why not?

General GARDNER. Sir, we looked at the overall—we are trying to develop a ground vehicle portfolio, if you will, of all the vehicles

that the Marine Corps has to accomplish its range of missions. We tried to standardize all of the armoring requirements and their resistance to threats, and we put this on that scale.

So we did look knowing that this was not going to have the force protection capability of an MRAP, for example. We were led to believe that this was not possible to achieve technologically without even more time and more delay than what we had. So we felt that this was, while a risk, an acceptable risk to be able to accomplish this capability in the right time.

If we got into those threat profiles where we expect to see this sort of underbelly mines, we would not use the EFV and the AED in those sorts of profiles. This is a niche capability that we are seeking to provide.

Mr. TAYLOR. Why would we rush to produce something that is probably already obsolete? Because, again, I greatly respect the Marine Corps making the most of what they have. I recently visited your guys in Fallujah in a helicopter I am told was built about 1972. That is pretty impressive that you have taken care of it this long. On the flip side, it means you have to live with your mistakes.

Why not correct that mistake before we make it?

General GARDNER. Sir, I can only say that we are trying to do that by looking at our ground vehicle mobility as a portfolio, and providing our force commanders a choice of vehicles, sufficient vehicle support out there so he can use the right vehicle on the right day for the right mission.

Mr. TAYLOR. Who owns the rights to the work done to date on the EFV? Is it the government or the contractor? If we wanted to take that design and turn it over to someone else for manufacture because we have just had enough of the folks we are dealing with, do we have the right to do that? That is the same question we have asked with the LCS, and same question we have asked with the Deepwater.

Mr. SMITH. I believe we do, sir, but I would have to absolutely confirm what level of technical maturity that data is.

Colonel TAYLOR. I would go one step further, sir, and say we own the right to potentially buy the data. It does not necessarily mean that we currently own all the data.

Mr. TAYLOR. Okay. For the record, would you ask the legal community to answer that question?

Mr. Bartlett.

Mr. BARTLETT. Mr. Chairman, why would we enter into a contract where we pay for everything and give them very generous fees for what in the real world would appear to be a failure? And then you have to buy the data rights from them? Weren't all these data developed with taxpayer money? Why do we have to pay for it twice? Because that is the way we wrote the contract?

Colonel TAYLOR. No, sir. This is fairly standard.

Mr. BARTLETT. But why do we want to pay for it twice? We have paid for it, because all of the money that they spent on this program has come from the taxpayer, plus some very generous fees. And now if we want the data rights, we have to pay them for it?

Colonel TAYLOR. Typically, the data that goes into the initial design is proprietary and the government has an opportunity to buy the data package.

Mr. BARTLETT. We run into this with many of the programs, and we have been assured that the Navy will in the future try to write the contract so that there is more assurance that what the taxpayer has paid for, the taxpayer in fact will have access to. That appears not to have been true in the past.

Thank you, Mr. Chairman.

Mr. TAYLOR. Thank you, Mr. Bartlett.

Mr. Ellsworth.

Mr. ELLSWORTH. Thank you, Mr. Chairman.

Just one last question for me, and Colonel, maybe you are the best one to answer. You started to allude to it about what we are doing now and the benchmarks. At what point and how long—and I want us to have a vehicle, from the bottom of my heart, I want the biggest, baddest military, the meanest, the best equipped, and then I am going to fight like hell to never have to use them, if I had to speak about a philosophy of mine.

How long do we go on, and how much—where is our end? Where do we say, or the vendor comes up and says, we just can't produce it; it is done; let's pull it and move on to plan. Or we say, we can't wait any longer; we can't spend any more dollars on this design. When does that occur? Is that one of the benchmarks, the first one? Or a group of those?

Colonel TAYLOR. Any one of the seven that I pointed out, eight, including the actual milestone to go into LRIP production. So that decision can come by virtue of the program manager's assessment at one of the knowledge points, that we are not on the reliability growth curve; or it can come by way of the acquisition decision executive at one of his three decision points prior to the actual LRIP decision that, hey, I am not comfortable with where the program is. So there are numerous opportunities to assess continuing the program.

Mr. ELLSWORTH. Just a basic time, is that going to occur in 2008, or end of 2007–2008?

Colonel TAYLOR. The three decision points by the acquisition executive comes at contract award, critical design review, and then before committing to long-lead items for the LRIP build. Those are the three acquisition executives.

And the first two occur roughly in fiscal year 2008. The third would not occur until just before the actual milestone C, so probably 2011. And then the knowledge points for the program manager, one occurs in 2008; two occur in 2011; and one is actually post-milestone C.

So it is over the course of about four years, there are almost seven of them.

Mr. AHERN. I would like to elaborate on that. As Colonel Taylor said earlier, the decision authority informed by the program manager and other events is the defense acquisition executive. As a result of this process, he has determined that he wants to look into the EFV on a quarterly basis. He has scheduled meetings with the CEO of General Dynamics, as well as the acquisition executive in

the Navy quarterly to review this program, as is done in industry on essentially the same kind of an investment review.

So I think besides, as Colonel Taylor mentioned, the knowledge points and the structured formalized meetings, the DAE working with the CEO of General Dynamics is going to keep a very close idea, pulse, on where this program stands for the duration of this development phase. I think that also goes to answer your question about are we focusing on looking at how the program manager is doing, what issues he has, and what alternatives he has when he runs into a problem, on a quarterly basis.

Mr. ELLSWORTH. Thank you, Mr. Ahern.

Mr. Chairman, I yield back.

Mr. TAYLOR. Hopefully in fairness to our witnesses, you have been very patient. You have been with us for a while. Is there anything that you would like to add at this point? I will just open it up to you.

Mr. AHERN. I would like to go back to your original question, Mr. Chairman. I was in the Navy. I was a program manager for ACAT–1 program. I have made a lot of mistakes, but now I am in AT&L. I think that the lessons learned through this process, is that we have begun to learn earlier or implement earlier, as General Gardner said, of the iron triangle.

We can no longer operate in that phase of a group of people who make up requirements and then a group of people decide how they are going to build it, and then another group of people decide how it is going to be funded. This has been changed.

As I mentioned earlier, that lesson learned of having the right combination of requirements, funding and an acquisition plan, including an informed sense of where the technology stands, is one of the clear things, or reinforcement of what came out of this Nunn-McCurdy process. Just the visibility of the numbers of groups of people that were involved—four teams per Nunn-McCurdy, and we had six Nunn-McCurdys in 2007—encourages me to think that we have all learned we have to birth them well.

And then further, I think as has been mentioned with this kind of event-driven schedules, the use of earned value, the use of the other management-focused things, including the CEO meetings, convinces me that we have applied the lessons learned from these programs so that in the future, our performance in acquisition in the requirements community will be improved over what it was previously.

Mr. TAYLOR. What are the most recent reliability statistics for those vehicles? I understand that they were supposed to go about 50 hours without breaking down. Now they are doing it in less than double digits. Is there any trend to give me or anyone else some degree of confidence that that problem has been overcome?

Mr. AHERN. I would defer to Colonel Taylor.

Colonel TAYLOR. I would say, sir, that you have brief glimpses in an operationally representative environment via operational testing, so those come in brief glimpses. To give you a pure look in the developmental test environment, it is not an apples-to-apples comparison predominantly because developmental test vehicles are loaded with orange wire and black boxes. A preponderance of the

maintenance associated with these vehicles—getting them ready for tests—involves configuration and de-configuration.

So there is a disproportionate amount of effort associated with getting prepared for developmental tests. So the metrics are not a good comparison. The best glimpse I can give you at this point are those knowledge points, where at knowledge point one in fiscal year 2008, the contractor is required to provide a new predicted reliability after the design.

So right there, we have our first glimpse of where the design falls relative to a growth curve that will ultimately get us to the KPP about four years later at IOT&E. So it is really through the systems engineering process that we have to rely right now. The developmental test process is not a very good gauge of it. The first pure operational opportunity does not occur until 2011.

Mr. TAYLOR. Are the problems across the board? Do they tend to be one thing in particular?

Colonel TAYLOR. Well, 60 percent of the reliability issues are associated either with the turret or the feed tray for the weapons system. Both these systems are proven technology on other applications. It is just that they weren't anticipated to undergo the stress and strain on this particular vehicle.

For instance, the turret is similar to I believe the one on the LPD–17. The weapons system is 70 percent common with some of the other ground combat vehicle systems, but the feed tray mechanism is unique. So reinforcing the structure that supports the turret and probably a redesign of the weapon feed tray are major initiatives to overcome what turned out to be 60 percent of the reliability issue.

Mr. TAYLOR. Mr. Bartlett.

Mr. BARTLETT. I have no more questions.

Mr. TAYLOR. Okay.

I thank you gentlemen for being here today.

The meeting stands adjourned.

[Whereupon, at 5:35 p.m., the subcommittee was adjourned.]

A P P E N D I X

JUNE 26, 2007

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

JUNE 26, 2007

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HOUSE COMMITTEE
ON ARMED SERVICES

TESTIMONY OF

MR. DAVID G. AHERN

DIRECTOR, PORTFOLIO SYSTEMS ACQUISITION

OFFICE OF THE DEPUTY UNDER SECRETARY OF DEFENSE
(ACQUISITION AND TECHNOLOGY)

BEFORE THE UNITED STATES HOUSE

COMMITTEE ON ARMED SERVICES

SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

June 26, 2007

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HOUSE COMMITTEE
ON ARMED SERVICES

STATEMENT BY
MR. DAVID G. AHERN

DIRECTOR, PORTFOLIO SYSTEMS ACQUISITION
OFFICE OF THE DEPUTY UNDER SECRETARY OF DEFENSE
(ACQUISITION AND TECHNOLOGY)

BEFORE THE UNITED STATES HOUSE

COMMITTEE ON ARMED SERVICES

SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

June 26, 2007

INTRODUCTION

Chairman Taylor, Ranking Member Bartlett, and Members of the Committee, thank you for the opportunity to discuss the Marine Corps' Expeditionary Fighting Vehicle (EFV) and the Nunn-McCurdy certification process. As you know the Marine Corps is a vital element of our land forces capability. The Marine Corps is undergoing change, not only relative to the structure of the force and personnel, but also to the equipment and systems that are necessary to support our 21st century national security goals and missions related to ground mobility. A critical piece of the ground mobility strategy is the Expeditionary Fighting Vehicle – it will provide our nation with a substantial capability for high-speed amphibious assault. On June 5, 2007 the Under Secretary of Defense for Acquisition, Technology, and Logistics certified a restructured EFV program to deliver that capability to the Marine Corps. Successful execution of the certified program, however, is contingent upon EFV receiving the full amount of funding requested in the Fiscal Year 2008 President's Budget.

Turning now to the specific questions directed to USD (AT&L):

1. EFV NUNN-McCURDY REVIEW PROCESS

The Secretary of the Navy notified Congress in February 2007 that the EFV program experienced a critical Nunn-McCurdy breach. Poor vehicle reliability, cost estimating problems, procurement quantity reductions, and reductions in the planned production rate were the significant contributors to the program cost growth.

The Nunn-McCurdy review process for EFV included the stand-up of four teams, aligned with each of the following certification requirements of Section 2433 of Title 10 United States Code:

1. Such an acquisition program is essential to the national security;
2. There are no alternatives to such acquisition program which will provide equal or greater military capability at less cost;
3. The new estimates of the program acquisition unit cost or procurement unit cost for such program are reasonable; and
4. The management structure for such acquisition program is adequate to manage and control program acquisition unit cost or procurement unit cost.

The Joint Staff led the team assessing whether the EFV is essential to National Security. Surface amphibious assault, in conjunction with air assets, enables joint forces to execute forced entry operations. The Joint Requirements Oversight Council (JROC) reviewed the joint capability area of amphibious assault and its essential characteristics, explored the systems that could provide amphibious assault capability, and reviewed the requirements for the EFV. The JROC validated the characteristics that provide the Joint Force Commander with an effective amphibious assault capability. This team provided the input that the capabilities of the EFV are essential to national security.

The Alternatives team identified a number of approaches to providing the needed capability, ultimately necking down to analyzing the cost and capability

associated with a restructured EFV program, a new start initiative to deliver comparable required capability, and an upgrade to the current Amphibious Assault Vehicle (AAV). This team concluded that there are no alternatives to the restructured EFV alternative which will provide equal or greater military capability at less cost. Initiating a new program would deliver capability later, increasing operational risk. Pursuing an upgraded AAV, while entailing lower costs, would provide less military capability due to the slow water speed of the AAV.

The Cost team, led by the Department's Cost Analysis Improvement Group, developed an independent estimate of the Research, Development, Test and Evaluation (RDT&E), procurement, and military construction costs and resource requirements for the restructured EFV program. The CAIG provided an independent cost estimate of the Program Acquisition Unit Cost and Average Procurement Unit Cost for the restructured program.

The Management team reviewed a broad spectrum of EFV program management and oversight practices including program execution, contract performance, systems engineering processes, organization and staffing, engineering risks, test planning, cost management, and acquisition planning. The team explored contributing factors and root causes of the Nunn-McCurdy breach. During its 8 weeks of effort, the team visited the contractor's facility, met with the program office on numerous occasions, and conducted detailed reliability, systems engineering, and Earned Value Management System assessments.

The restructured program was reviewed in depth and a risk assessment was conducted and risk burn down plan prepared. In addition to ensuring that the management structure is adequate to manage and control program and unit costs the team also developed information supporting the contributing factors documentation for Nunn-McCurdy certification. Recommendations were developed for actions to address program risks and a set of oversight, monitoring,

and reporting mechanisms were developed to ensure successful management of the program. These recommendations included:

a. Establishing additional EFV acquisition decision points prior to the Low-Rate Initial Production Decision (Milestone C) aligned with the Preliminary Design Review and the Critical Design Review. Design review information, combined with an updated USMC assessment of any available trade-space in the EFV required performance characteristics will support these potential EFV acquisition "off-ramps".

b. Implementing an effective Earned Value Management (EVM) process to manage and control program cost, schedule and performance and reflect actual program progress. Additionally, in accordance with Department of Defense policy, the Defense Contract Management Agency (DCMA) will conduct an Earned Value Management System Compliance Review of General Dynamics Land Systems – General Dynamics Amphibious Systems.

c. Instituting rigorous systems engineering processes with clear design review expectations, configuration baseline management, and design analysis and prediction tools.

d. Establishing advisory bodies with subject matter experts to provide the Program Manager with assessments on planning, execution, and data analysis for EVM, test, and design processes and events.

The USD (AT&L) has signed out an Acquisition Decision Memorandum that directs these, and other, changes for managing the restructured EFV program.

2. EFV NUNN-McCURDY OUTCOME

On June 5, 2007 the Under Secretary of Defense for Acquisition, Technology and Logistics certified to Congress a restructured EFV program in accordance with Section 2433 of Title 10 United States Code. Additionally, the Under Secretary briefed the staff directors on his Nunn-McCurdy decisions on June 5. The certification is based on a review of the program reflected in the Selected Acquisition Report for 2006.

The restructured EFV program extends System Development and Demonstration to resolve the reliability issues with the EFV design. A second set of EFV prototypes will be built and tested, delaying the Low-Rate Initial Production decision by roughly four years to 2011. The restructured program will deliver 573 vehicles for the Marine Corps.

The Joint Requirements Oversight Council affirmed the need for a high-speed amphibious assault capability. There is risk, however, in acquiring the defined capability within the newly proposed timeframe and available resources. Maintaining the cost and schedule established with the restructured program is critical.

While a series of thorough, independent reviews indicate the reliability challenges can be overcome, neither the Marine Corps nor the contractor has performed well over the life of this program. Mindful of this history, and the remaining program risks, we are implementing a specific set of oversight, monitoring, and reporting mechanisms targeting contract performance and systems engineering, to aid in successful management of the program.

Successful execution of the certified program requires funding to the Cost Analysis Improvement Group estimate and is contingent upon EFV receiving the full amount of funding requested in the Fiscal Year 2008 President's Budget.

3. NUNN-McCURDY LESSONS LEARNED

The USD (AT&L) took the Nunn-McCurdy certification process very seriously. His decisions were based on a rigorous review process addressing each certification question. The Department is processing the lessons from this last "season of Nunn-McCurdys" by identifying ways to execute the certification process more effectively, exploring how the programs got to a critical Nunn-McCurdy breach, and, most importantly, identifying initiatives that will lessen the probability of future Nunn-McCurdy breaches.

The certification process involved a very significant staff effort by multiple disciplines from across the Department, with significant involvement by the Joint Staff and the Services. The effort included actions to establish the facts surrounding the root causes of the breach; to review and confirm the operational capability requirements; to identify and evaluate alternative decision paths; and to detail solutions and actions needed for certification. A critical Nunn-McCurdy breach requires a major investment of time and resources by the Department--therefore identifying ways to target problem programs early for attention prior to a breach is prudent.

The Department is pursuing a number of initiatives to avoid similar Nunn-McCurdy breaches in the future. The Department will be conducting a rapid review of our major acquisitions to identify any problem programs for early attention. Additionally, we are working to frame markers for earlier program intervention.

Department initiatives reported in the February 2007 Defense Acquisition Transformation Report to Congress (John Warner National Defense Authorization Act Fiscal Year 2007, Section 804), will also aid in precluding Nunn-McCurdy breaches. The Concept Decision initiative will help in aligning the acquisition, requirements, and resources communities for a corporate commitment across the department's business processes before starting a new acquisition program. From

this "Big A" acquisition perspective, starting programs with a corporate alignment of our business processes will aid tremendously in establishing a stable, executable baseline. This approach will be strengthened by emphasizing incremental delivery of capability to support time certain acquisition. The Department will also evaluate current programs for consideration of incremental delivery of capability to aid in addressing requirements growth considerations.

Our revitalized Defense Acquisition Executive Summary efforts will help track and monitor program progress and will utilize tripwires to target attention to programs early. A number of Department initiatives address ways to improve our insights to contractor performance. The Earned Value Management process, with current, valid contract data, will help us identify and track metrics for leading indicators to provide early warnings of contract performance cost and schedule growth. We have established a central data repository for contract performance data, and data fidelity and integrity in contractor reporting is improving.

The Department continues to strongly support improving systems engineering across the enterprise to ensure that the necessary rigor for system development is programmed in and supported through all acquisition phases. Additionally, Program Management Agreements are being developed to establish a "contract" between the program manager and the acquisition, requirements, and resource officials for a common basis for understanding and accountability for specified resourced and achievable acquisition plans.

The Department will continue to review the lessons of the Nunn-McCurdy certification efforts to date. Acquisition initiatives that help reduce the risk in acquiring defined capability within programmed timeframes for the available resources are vital to precluding future Nunn-McCurdy breaches.

CONCLUSION

In closing, the Department has certified a restructured EFV program to acquire the high-speed amphibious assault capability needed by our Marine Corps. Clearly, there are acquisition risks that require Department, Service, program office, and contractor attention to deliver the required capability within the newly proposed timeframe and available resources. Maintaining the cost and schedule established for the restructured EFV program is critical.

The rigorous Nunn-McCurdy certification process itself was insightful. The ability of the Department to frame the markers for early intervention for programs, prior to breaches, is paramount. Initiatives to improve our acquisition processes continue to be a Department priority.

I thank the committee for their time today, and their leadership in addressing the Marine Corps operational needs. This committee has consistently provided our men and women in the Armed Forces with the systems and support they need. Thank you for your unwavering support to our warfighters, and I would happy to take any questions.

NOT FOR PUBLICATION UNTIL RELEASED
BY THE HOUSE ARMED SERVICES COMMITTEE

STATEMENT
OF
ROGER M. SMITH
DEPUTY ASSISTANT SECRETARY OF THE NAVY
(EXPEDITIONARY WARFARE)

AND

COLONEL WILLIAM TAYLOR
PROGRAM EXECUTIVE OFFICER LAND SYSTEMS (PEO LS)

BEFORE THE

SUBCOMMITTEE ON SEAPOWER AND EXPEDITIONARY FORCES OF THE
HOUSE ARMED SERVICES COMMITTEE

ON

MARINE CORPS'
EXPEDITIONARY FIGHTING VEHICLE PROGRAM

June 26, 2007

NOT FOR PUBLICATION UNTIL RELEASED
BY THE HOUSE ARMED SERVICES COMMITTEE

Roger M. Smith
Deputy Assistant Secretary of the Navy
(Expeditionary Warfare)

Mr. Smith was appointed to his current position in January 2007. He previously served from June 2003 through January 2007 as the Deputy Assistant Secretary of the Navy (Littoral and Mine Warfare). He serves as the primary advisor to the Secretary of the Navy and the Assistant Secretary of the Navy (Research, Development, and Acquisition) for Marine Corps ground and amphibious weapon systems, special warfare programs, and improvised explosive device countermeasures. Since December 2003, he has also been the Department of the Navy's coordinator for all Operation Iraqi Freedom and Enduring Freedom rapid procurement and technology fielding and IED countermeasures for joint warfighting requirements.

Prior to his appointment, he served on the House Armed Services Committee from May 1996 – June 2003 as a professional staff member with oversight responsibilities for Army procurement programs and Marine Corps ground and amphibious weapon systems, as well as all conventional ammunition. He also was responsible for monitoring precision-guided munitions expenditures and the related industrial base production requirements to replace those weapons and defense technology transfer issues in support of homeland security requirements.

From January 1994 - May 1996, Mr. Smith was the Manager of Government Business for the American Electronics Association, the country's largest high technology trade association. He managed all policy issues related to government procurement of defense electronics, the defense industrial and technology bases, and medical electronics. He also managed the financial account and policy related issues for the National Electronics Manufacturing Initiative, a start-up government-industry partnership designed to reconstitute the manufacturing capacity for integrated circuits in the United States.

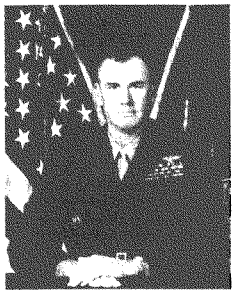
Mr. Smith served from October 1991 – October 1993 as the Manager of Marketing Development and Government Relations for Vernitron Corporation, a manufacturer of electronic guidance and control systems for precision guided munitions, radars, and strategic and tactical surveillance and intelligence systems. He led and coordinated analytical, engineering and marketing teams responsible for designing and developing new guidance and control systems and upgrades to numerous weapon systems.

Prior to his transition to industry, Mr. Smith served on active duty from December 1981 – October 1991 as both a naval intelligence and naval flight officer. As an intelligence officer, he performed assignments as a geopolitical and strategic analyst and as an indications and warning and briefing officer with the U.S. Pacific Command. During Operation Desert Storm, Mr. Smith served as a Navy human intelligence collection manager and case officer. As a naval flight officer, he flew in the Lockheed S-3A Viking. Mr. Smith also served as a U.S. Senate liaison officer in the Navy's Office of Legislative Affairs. He remains active in the Navy Reserve as a Captain, and is currently assigned to the Office of the Secretary of Defense's Technology Transfer Reserve Intelligence Unit.

Mr. Smith is from Charlotte, North Carolina, and a graduate of the University of North Carolina at Chapel Hill where he received a Bachelor of Arts degree and his commission in the Navy through a Naval ROTC scholarship. He is also a graduate of several professional military schools including the Navy Fighter Weapons Ground School (TOPGUN), Naval Strike Warfare Center School, and the Navy and Marine Corps Intelligence Training Center.

1 May 2007

MARINE CORPS SYSTEMS COMMAND



COLONEL WILLIAM E. TAYLOR
UNITED STATES MARINE CORPS
PROGRAM EXECUTIVE OFFICER, LAND SYSTEMS

Colonel Taylor was born in New Brunswick, New Jersey on 23 February 1957. Following graduation from Rutgers University in May 1979, he was commissioned a Second Lieutenant through the Platoon Leader's Class (PLC) Program. He reported for active duty in October 1979.

Following the Basic School and completion of flight training in Pensacola, Florida Col Taylor was designated a Naval Aviator in July 1981. He then reported to HMT-204, MCAS New River, North Carolina for training as a CH-46 Pilot.

He completed his first fleet assignment with the Golden Eagles of HMM-162 from 1982 to 1987, and saw combat as a member of the 24th MAU, ordered to Beirut, Lebanon in May 1983. Additional deployments included operations throughout Europe, Africa, Central America and several Caribbean locations. His collateral duties included assignments as Squadron Legal Officer, Quality Assurance Officer (Maintenance Department), and Squadron Weapons and Tactics Instructor (WTI).

In June 1987 Col Taylor reported to Marine Helicopter Squadron One (HMX-1), Quantico, VA. Squadron assignments while at HMX-1 included Operational Test Director (OT&E Dept), Flight Line Division Officer, Avionics Officer, and VH-60N Program Coordinator. He was designated a Marine One Pilot in May 1990.

In July 1991 Col Taylor reported for duty as the Operations Officer for the White Knights of HMM-165, 1ST MEB, MCAS Kaneohe Bay HI. Major deployments included two rotations to Okinawa Japan, in support of the Unit Deployment Program (UDP). Additionally, Col Taylor served as Detachment Commander for two separate missions to Cambodia in support of Joint Task Force Full Accounting (JTF-FA), first in October 1992, and again in March 1993. The second mission was abruptly terminated when the Det's jungle encampment came under fire by hostile forces.

In June 1994 he reported to the Naval Postgraduate School, Monterey California where he earned a Master of Science Degree in Defense Systems Acquisition Management in March 1996. Col Taylor then reported to the Naval Air Systems Command to commence his Acquisition "payback" assignment, first as the Deputy Program Manager (DPM) for Threat Protection (PMA-202), and later, as the Deputy for Operations (Marine), PEO (A).

In January 1999 Col Taylor reported to the Deputy Assistant Secretary of the Navy, Aviation Programs (DASN Air) to provide oversight of Marine Aviation Programs for an interim six-month period, before assuming command of PMA-226 as the H-46 Program Manager in July of 1999.

From August 2002 through November 2003 Col Taylor served as the Marine Military Assistant to the Assistant Secretary of the Navy for Research, Development & Acquisition, and on 1 December 2003 reported for duty as the Deputy Program Manager for the V-22 Program, assuming command of PMA-275 as the V-22 Joint Program Manager in October 2005.

Col Taylor became the Marine Corps' first Program Executive Officer (PEO) when he assumed duties as the PEO for Land Systems in January 2007.

Col Taylor's personal decorations include the Legion of Merit (Gold Star in lieu of second award), Meritorious Service Medal, two Strike Flight Air Medals, the Navy Commendation Medal (Gold Star in lieu of second award), and the Combat Action Ribbon. He has over 4700 flight hours. Col Taylor is married to his high school sweetheart, the former Maritza Matthijs of Edison, New Jersey. They have two children, Patrick (age 15) and Shannon (age 11).

29 Jan 2007

Mr. Chairman, distinguished members of the Subcommittee, thank you for the opportunity to appear before you and discuss the current status of the Expeditionary Fighting Vehicle (EFV) program, its restructuring following the Nunn McCurdy Certification process and the way ahead for the program.

INTRODUCTION

As requested by this subcommittee, the Navy is providing testimony regarding the programmatic and technological factors that led to the EFV's reliability issues in 2006; the outcome of the Nunn-McCurdy certification process and the management initiatives the Department is pursuing to avoid similar major acquisition program challenges.

The Expeditionary Fighting Vehicle (EFV) is a top priority program for the Marine Corps. The EFV will provide the capability for the Marine Corps to perform its Title 10 mission of projecting combat power from the sea in increasingly anti-access security environments. With its ability to move at speeds in excess of 25 miles per hour in the water, combined with its superior land mobility, lethality and survivability, the EFV will provide both over-the-horizon amphibious capability and significantly greater warfighting capability on land than the current Amphibious Assault Vehicle.

The EFV is a keystone for both the Marine Corps Expeditionary Maneuver Warfare and Ship-to-Objective Maneuver warfighting concepts. Its over-the-horizon forced entry capability is critical to the success of the Marine Air-Ground Task Force (MAGTF) in supporting the missions of Combatant Commanders.

The EFV offers enhanced survivability for the embarked Marine rifle squad with its lightweight modular armor, mine-blast protected seating, and collective Nuclear, Chemical and Biological protection. It also provides superior lethality with its stabilized, day/night capable MK46 Weapon Station.

RELIABILITY

During the fall of 2006, the Assistant Secretary of the Navy, Research, Development and Acquisition (ASN (RDA)) chartered an Independent Expert Program Review to examine the EFV program, system and processes in order to find the root causes of the reliability shortfall and recommend a path forward for the EFV Program. The panel reported that the root causes of poor reliability were: 1) insufficient funding in early System Development & Demonstration (SDD) that led to inadequate systems engineering rigor in design for reliability; 2) focus on the high water speed requirement, which drove weight and complexity at the expense of reliability, and; 3) overconfident program advocacy. The panel also cited shortcomings in program organization and management, oversight and test and evaluation as contributing factors.

The EFV was scheduled to enter Low Rate Initial Production (LRIP) in January 2007. In preparation for the LRIP decision, Marine Corps Operational Test and Evaluation Activity

conducted an Operational Assessment (OA) of the system's capabilities. While the EFV demonstrated that it can perform all of its required mission essential functions: (move on water, move on land; carry and protect 17 combat-equipped Marines, fire accurately and communicate on the move), it showed lower than projected reliability. Because reliability did not meet projections, we determined that the EFV was not ready for LRIP.

During this period, The Defense Department's Strategic Planning Guidance directed the Marine Corps to look at its entire mix of vehicles for providing mobility across the spectrum of conflict. As a result, the EFV production quantities were reduced from 1,013 vehicles to 573 vehicles to allow the Marine Corps larger procurement quantities of other vehicles and provide protected ground mobility to the greatest possible portion of the MAGTF.

Following submission of the FY08 President's Budget in early February, the Secretary of the Navy (Dr. Winter) provided notification to Congress that the EFV was in critical breach of Nunn-McCurdy thresholds for both Program Acquisition Unit Cost and Average Procurement Unit Cost. Unit cost estimates for the vehicle increased beyond Nunn-McCurdy thresholds as a result of cost estimation changes, the quantity reduction, industrial base issues, and the need to extend development.

After extensive reviews by independent expert panels chartered by the Navy and OSD, as well as comprehensive review during the Nunn-McCurdy certification process, the program has been restructured to extend SDD until Fiscal Year 2011 in order to improve reliability.

NUNN-MCCURDY CERTIFICATION PROCESS

As a result of the Nunn-McCurdy breach, in February 2007, the EFV Program completed a comprehensive reliability design review using Fault Tree Analysis: to understand the true reliability requirement of each subsystem in the vehicle, compare demonstrated reliability to required reliability throughout the system, determine whether the reliability requirement was attainable, and identify subsystems in need of redesign. The analysis was reviewed and confirmed by an independent team led by the Army's PEO Ground Combat Systems. The analysis indicated that the EFV reliability requirement is realistically achievable. It highlighted the need for redesign in the hydraulics and vehicle electronics systems as well as in the power transfer module subsystem, selected turret subsystems (auxiliary sight, feed, link ejection, and structure) and selected transmission subsystems (braking subsystem, transmission electronic control unit subsystem and transmission control software).

Following that five-month review, The Secretary of Defense (responsibility delegated to USD (AT&L)) [Mr. Kenneth Krieg], certified on June 5, 2007, to Congress with respect to the restructured EFV program that:

- such acquisition program is essential to the national security;
- there are no alternatives to such acquisition program which will provide equal or greater military capability at less cost;

- the new estimates of the program acquisition cost or procurement unit cost for such program are reasonable; and
- the management structure for such acquisition program is adequate to manage and control program acquisition unit cost or procurement unit cost.

Thus, EFV will undergo a certified restructured program that extends SDD to allow subsystem and component redesign for reliability, fabrication and test of a second set of EFV prototypes, with Milestone C (MS C) in 2011. The restructured program delivers Initial Operational Capability in 2015 and Full Operational Capability in 2025.

PROGRAM RESTRUCTURING

The restructure includes (1) Design for Reliability phase through FY08 to redesign major subsystems including the turret, hydraulics, software, and electrical, electronic and C4I systems; (2) Fabrication and developmental test of seven new SDD prototype vehicles; and (3) Additional OA of the new prototype vehicles in FY11. Three additional USD (AT&L) decision points have been added to the program before Milestone C to assess program readiness and provide "off-ramps" if necessary -- before (1) awarding a new contract; (2) proceeding beyond Critical Design Review; and (3) before long lead material can be procured for LRIP.

WATER MOBILITY KEY PERFORMANCE PARAMETER

In May 2007, in conjunction with the EFV Nunn-McCurdy Process, the Joint Requirements Oversight Council reviewed the EFV Key Performance Parameters documented in the 2006 EFV Capabilities Production Document. All Key Performance Parameters were revalidated with a slight change made to the High Water Speed Key Performance Parameter.

The High Water Speed Key Performance Parameter operating envelop was reduced from a significant wave height of three-feet to a significant wave height of two-feet (fully developed sea state) to provide the program a thousand pound weight margin for use in improving system reliability without compromising mission effectiveness or combat capability while conducting Ship-to-Objective Maneuver with the EFV.[1]

Prior to the OA conducted in January 2006 for the anticipated LRIP, the EFV program strategy had been to increase reliability through the reliability growth process. The mission reliability demonstrated at OA, however, showed that this process was insufficient to generate reliability growth necessary in time to meet the requirement at Initial Operational Test and Evaluation.

[1] A worldwide wave and surf statistics binder was developed in 1997 by Neptune Sciences, Inc., under contract from Naval Research Laboratory, which captured surf model runs relevant to the Marine Corps. The analysis related dominant meteorological, oceanographic, and geographic coastal features to Ship-to-Objective Maneuver.

Therefore, a Design for Reliability (DFR) effort was initiated to generate significant improvement to reliability. The DFR effort currently underway includes the overarching systems engineering processes to mature the EFV design and vehicle reliability growth as well as the detailed planning, redesign and validation efforts for EFV components and subcomponents to meet their reliability allocations.

Upon completion of the DFR process, we will build and test new prototypes to validate the results of the DFR effort and verify the Reliability Key Performance Parameter can be achieved prior to an LRIP decision.

NEW PROTOTYPES AND TESTING

The current SDD prototype vehicles have been vigorously tested and they have now reached the wear and tear equivalent of a 20-year service life, which is adversely impacting the ability to distinguish inherent vehicle reliability performance from age-induced failures. To continue growing reliability, new test assets are necessary to verify new design changes. The contract for the newer prototypes has not yet been awarded. Seven (7) new SDD vehicle assets are expected to be built during FY08-10 and undergo developmental and operational testing in FY10/11. The new prototypes will be built in Lima, Ohio. The FY08 President's Budget is estimated to cover the FY08 requirements, and the FY09 funding will be requested in conjunction with the FY09 budget cycle.

MANAGEMENT AND OVERSIGHT INITIATIVES

Minimizing risk in acquiring the defined capability within the proposed timeframe and available resources is paramount.

To minimize risk, changes in the acquisition reporting structure have been enacted. On February 5, 2007, ASN RDA established a Program Executive Office (PEO) for Marine Corps Land Systems (LS); this PEO reports directly to the ASN RDA. The former Program manager for the MV-22 Osprey program, Colonel Bill Taylor, was selected as the Program Executive Officer (LS). The establishment of PEO LS enables the focal concentration of premier acquisition management capabilities on our major Marine Corps programs. In effect, we've formed a center of excellence under Colonel Taylor's experienced leadership and the efforts of his expert staff with the sole purpose of devoting full-time attention to its programs' acquisition and life cycle management responsibilities. PEO LS is chartered to directly supervise management of assigned programs with particular emphasis on maintaining oversight of cost, schedule, and performance. Establishment of the PEO also promises to maximize and optimally leverage the contributing capabilities of the Marine Corps Systems Command, which serves as the host systems command and provides vital support to the PEO.

The EFV is one of eight programs assigned to the PEO at present. A few of the highlights of what the PEO brings to the EFV Program oversight include: an incisive understanding of the need for a comprehensive and integrated approach conceptualizing and applying effective systems engineering best practices; a concentration of expertise on reliability issues at the system

and subsystem level; and a significantly increased level of vigilance and competency in professional risk management.

As part of the EFV Program's Certification, for example, PEO LS is establishing an EFV Senior Executive Review Board (SERB) to provide oversight to the EFV Program. The SERB will provide a significant depth of knowledge and experience in the key functional and program management competencies to assess and monitor program health and recommend corrective actions where needed. This board of veteran acquisition and associated professionals will provide the intensified and comprehensive oversight necessary for the EFV Program's success.

PROGRAM OFFICE REORGANIZATION

The EFV Program Manager restructured the program office on May 18, 2007. The restructure created a product-based organization in which senior personnel are assigned responsibility for major product groups. Each product group lead is responsible for making decisions regarding engineering, design, reliability, cost, build and life cycle support aspects of his designated subsystems within the parameters that have been allocated through the systems engineering process. A Systems Engineering Directorate has been created to ensure sound systems engineering procedures drive continued development. The new Senior Systems Engineer reports directly to the EFV PM and oversees integration of the total EFV system.

The contractor management structure has also recently changed to align with an integrated program management philosophy and to bring the necessary expertise to the program.

The EFV Program Manager, along with the contractor, will be required to provide quarterly briefings to ASN RDA, the Secretary of the Navy, and USD (AT&L) to determine whether the program is progressing adequately and risks are being mitigated.

GENERAL RISK REDUCTION INITIATIVES

Early findings emanating from with the Navy's investigation into Littoral Combat Ship cost overruns has resulted in the establishment of recurring, detailed ASN RDA reviews of all major Navy acquisition programs and the implementation of specific, robust initiatives aimed at early risk detection and mitigation. Some of those specific initiatives that the EFV Program has benefited from as well, include:

- A complete review of program staffing levels and skill sets.
- Thorough analysis and identification of program design / build concurrency levels.
- A mandatory day long program management lessons learned workshop.

CONCLUSION

The Joint Requirements Oversight Committee (JROC) has affirmed the need for a high-speed amphibious assault capability. The Department of Navy and The Marine Corps are committed to ensuring the restructured program meets cost, schedule and performance objectives.

The Navy has postured the EFV Program for future success. However, it is critical that the program as restructured and supported by the CAIG estimate be fully funded at the $288 million requested in the (RDT&E,N account) FY 2008 President's Budget.

Mr. Chairman, I would like to conclude my opening statement by quoting The Commandant of the Marine Corps, General James Conway, who has said, "until the EFV comes online, the Marine Corps is in a period of risk".

NOT FOR PUBLICATION UNTIL RELEASED
BY THE HOUSE ARMED SERVICES COMMITTEE

STATEMENT
OF

LIEUTENANT GENERAL EMERSON N GARDNER JR
DEPUTY COMMANDANT, PROGRAMS AND RESOURCES DEPARTMENT,
HEADQUARTERS UNITED STATES MARINE CORPS

BEFORE THE

SUBCOMMITTEE ON SEAPOWER AND EXPEDITIONARY FORCES OF
THE
HOUSE ARMED SERVICES COMMITTEE

ON

MARINE CORPS'
EXPEDITIONARY FIGHTING VEHICLE PROGRAM

June 26, 2007

NOT FOR PUBLICATION UNTIL RELEASED
BY THE HOUSE ARMED SERVICES COMMITTEE

Lieutenant General Emerson N. Gardner, Jr.

Deputy Commandant for Programs and Resources

Lieutenant General Gardner is currently assigned as the Deputy Commandant for Programs and Resources at Headquarters, Marine Corps.

Lieutenant General Gardner is a 1973 cum laude graduate of Duke University; he was named an Olmsted Scholar for 1978 and studied history and political science for two years at Goettingen, Germany. He is a graduate of The Basic School, Defense Language Institute, Marine Corps Command and Staff College, Armed Forces Staff College, the Norwegian Defense College and the National Security Leadership Course at the Maxwell School of Citizenship and Public Affairs at Syracuse University.

A Naval aviator since 1974, Lieutenant General Gardner has served as a helicopter pilot in all three Marine Air Wings. At HMX-1 from 1980-1985 he was a White House Liaison Officer and Presidential Helicopter Command Pilot. As Commanding Officer of HMM-261 from 1989-1991, Lieutenant General Gardner led the Raging Bulls in Operation Sharp Edge, the evacuation of Liberia, and Operations Desert Shield and Storm. He has more than 4,300 flight hours in most of the aircraft currently in the Marine Corps inventory.

Lieutenant General Gardner served as Commanding Officer of the 26th Marine Expeditionary Unit (Special Operations Capable) for two deployment cycles to the Mediterranean from 1996 to 1998. During his tour the MEU conducted Operation Silver Wake, the non-combatant evacuation (NEO) of Albania, Operation Guardian Retrieval, contingency support for a NEO of Kinshasa, Zaire and Dynamic Response, the first employment of SACEUR's Strategic Reserve into Bosnia.

As a staff officer, Lieutenant General Gardner has served as G-3 Current Ops Officer with the 9th Marine Amphibious Brigade in Okinawa, Deputy G3 for II Marine Expeditionary Force and as the J-3 (Operations Officer) for the Standing Joint Task Force, MARFORLANT. From 1993-1995 he was the Assistant Chief of Staff for Operations and Logistics at Allied Forces Northern Europe at Kolsas, Norway and at Allied Forces Northwestern Europe, in High Wycombe, England. From 1998-2000 he served as Assistant Deputy Commandant for Aviation at Headquarters Marine Corps, Washington DC. His tour as the Deputy Commander of US Marine Corps Forces, Atlantic from 2000-2002 included extended temporary additional duty as the Deputy J-3 for Current Operations at US Central Command in support of Operation Enduring Freedom. Most recently General Gardner was the Director for Operations, J3 at US Pacific Command.

Chairman Taylor, Congressman Bartlett, and distinguished Members of the Committee, I thank you for the opportunity to provide information on the Marine Corps' requirements for the Expeditionary Fighting Vehicle, our plans to resource its acquisition and how the program relates to other major ground vehicle modernization programs.

Requirements. The EFV is a high-speed, tracked, armored amphibious assault vehicle designed to move Marines from amphibious ships located over-the-horizon to objectives up to 100 miles inland. Once ashore, the EFV has the speed and maneuverability to operate with the M1A1 Abrams tank. The EFV enables the Joint commander to use oceans, lakes and rivers as avenues of approach and maneuver. Manned by a crew of three Marines, the vehicle has a troop capacity of 17 Marines with their individual combat equipment. Unlike previous assault amphibian craft, the EFV possesses an advanced, stabilized, 30-millimeter cannon that is both lethal and highly accurate. While designed for forcible entry from the sea, the EFV will augment forward deployed Marines with additional capabilities suitable for missions such as non-combatant evacuation operations, humanitarian assistance, disaster relief, ground mechanized operations, and security operations.

The EFV's high-speed land and water maneuverability and highly lethal day/night fighting ability significantly enhance the capability of Marine forces in support of the Joint commander. The EFV is the final piece to the three-pronged approach to achieving over-the-horizon forcible entry from the sea. In conjunction with Marine tiltrotor and rotary wing aircraft and Navy Landing Craft Air Cushion (LCAC) vehicles, the EFV enables the insertion of significant Marine forces from ships directly to operational objectives inland. The EFV is the essential remaining piece to this national requirement. It provides the Marine Air-Ground Task Force (MAGTF) with the rapid build-up of combat power necessary to face increasingly capable enemy forces. Without the EFV, naval ships will have to come within the range of coastal defenses to offload Marines by legacy surface means such as the Assault Amphibious Vehicle (AAV).

In response to tasks in the 2006 Strategic Planning Guidance, the Marine Corps assessed our mission, force laydown, future threats and modified our planned tactical mobility portfolio. The new portfolio includes 573 EFVs -- a reduction from the previous acquisition objective of 1,013 EFVs – and about 600 wheeled expeditionary vehicles. In conjunction with the Joint Light Tactical Vehicle (JLTV), the new portfolio provides increased capability and capacity for

irregular operations while maintaining necessary capability and capacity for forcible entry operations. The portfolio provides sufficient EFVs to support the surface assault portion of a forcible entry operation consisting of two Marine Expeditionary Brigades – a force that could total approximately 30,000 Marines, maintain our forward presence mission with Marine Expeditionary Units (MEUs), and support necessary training and maintenance activities. The procurement of armored wheeled vehicles will give the Corps flexibility in ground operations to include certain irregular warfare operations. This combined vehicle fleet provides greater flexibility and equivalent carrying capacity as the original EFV program at substantially lower cost.

As part of the OSD effort to certify the EFV program this past spring, the Marine Corps conducted a complete review of the program's cost, schedule, and performance. Technical experts and operators assessed every facet of the EFV and made recommendations on how to best restore the health of this critical program. The primary focus of the effort was to increase vehicle reliability to an acceptable level, a goal that would require additional design efforts and weight growth. To provide the necessary room for reliability growth, three modifications to vehicle performance have been made.

First, we removed the vehicle's smoke grenade capability. This capability is a hold-over from the original program Operational Requirements Document (ORD) and provides a legacy capability no longer required.

Second, we changed the operating construct and reduced the fuel carried for ship-to-shore movements by up to 100 gallons. The fuel used for a forcible entry operation will provide sufficient range for a 25-nautical mile high water speed approach and a 100-nautical mile combat operating radius ashore. In exclusive land operations, the EFV retains a combat operating radius of 345-nautical miles.

Third, we changed a water mobility key performance parameter (KPP), reducing the high water speed significant wave height requirement from 3 feet to 2 feet. A working group of Marine operators and technologists determined that this change will have minimal impact on operational capability and any affects could be mitigated by a minor change in tactics, techniques or procedures (TTPs).

These modifications provide an additional 1,750 pounds of weight growth capacity for critical design work required to achieve desired reliability without significant impact upon the

vehicle's operational suitability. The new EFV program represents a prudent balance of cost, schedule, and performance.

Resources. The Marine Corps is committed to funding the restructured EFV program using cost estimates determined by the Office of the Secretary of Defense's Cost Analysis Improvement Group (CAIG). The new CAIG estimate for FY 2008 is $22M greater than the amount requested in the President's FY 2008 budget. To address this shortfall, the Marine Corps will use FY 2007 EFV program funds that have become available as a result of the program pause to accommodate the Nunn-McCurdy review process. The use of FY 2007 EFV resources to fund the FY 2008 shortfall will ensure that the revised EFV program remains on track without disrupting any other portion of the FY 2008 budget. For FY 2009 and beyond, the Marine Corps will present a budget that funds the program to the CAIG estimate across the FYDP.

We believe the EFV program to be affordable. Our PR 2009 budget proposal to the Secretary of the Navy proposes fully funding the program through FY 2013. As a percentage of our total Marine Corps procurement account, EFV procurement funding will not exceed 39% of our total investment within the 2009-2013 FYDP. After FY 2013 and until fully fielded, the EFV accounts for approximately 34% of the Marine Corps procurement budget. While we cannot presume to know the Marine Corps' funding levels through the end of the EFV buy, we believe that this level of funding is affordable for this essential and one of a kind national capability.

USMC Ground Vehicle Modernization Programs. As the nation's force in readiness, the Marine Corps must possess a range of ground vehicle capabilities. Like the Marine Corps itself, the mix of type and number of troop transport vehicles must be balanced to handle a range of missions and threats. Our vehicle modernization strategy is aimed at providing the vehicles to achieve this balanced objective.

We intend to replace our 1,300 legacy Assault Amphibious Vehicles (AAVs) with a fleet of 573 EFVs and approximately 600 Marine Personnel Carriers (MPC), armored wheeled vehicles similar to the Army's STRYKER or a personnel variant of our current Light Armored Vehicle. The exact type and number of this wheeled partner vehicle is the subject of an ongoing analysis of alternatives. This mix of tracked and wheeled vehicles will be able to move from

ship to shore independently or in LCACs and once ashore move as fast as supporting M1A1 tanks.

We currently have over 23,000 unarmored and armored HMMWVs. We are procuring 3,700 Mine Resistant Ambush Protected (MRAP) vehicles to replace them where possible in Operations Iraqi Freedom and Enduring Freedom (OIF / OEF). While the MRAP is very effective against Improvised Explosive Devices (IEDs) and will make an immense difference in the current fight, it is not the expeditionary vehicle we want to replace all of our HMMWVs for the long term. We are teamed with the Army to develop the Joint Light Tactical Vehicle as a more capable, expeditionary replacement for the HMMWV. The FY 2008 President's Budget submission robustly funds the Research and Development (R&D) for this vehicle to speed its fielding without sacrificing required capabilities.

The Marine Corps Combat Development Center is conducting a comprehensive analysis of our ground vehicle fleet that will capture the myriad requirements and develop a comprehensive fielding plan to achieve these capabilities. That plan will shape our POM 2010 submission.

The EFV is essential to this nation's forcible entry capability - a capability that provides strategic influence in a dangerous world. Without the EFV, the United States does not have the ability to conduct surface assaults from ships over the horizon. If told to perform our primary mission today, Navy ships would have to operate well within range of coastal defenses. Rapidly acquiring the EFV reduces the risk of casualties and the loss of ships. Our forcible entry operations project power using the triad of Marine tiltrotor and rotary wing aircraft, Navy Landing Craft Air Cushion (LCAC) vehicles, and the EFV. As such, the Marine Corps is committed to fully resourcing the EFV program. It occupies the center of our tactical vehicle modernization strategy and will ensure we are prepared to operate across the spectrum of conflict when our Nation needs it the most. Thank you for this opportunity to address the Committee.

QUESTIONS AND ANSWERS SUBMITTED FOR THE RECORD

JUNE 26, 2007

QUESTIONS SUBMITTED BY MR. TAYLOR

Mr. TAYLOR. Were there signs, before the fall of 2006, that the reliability of the EFV prototypes was going to be such a major problem? Were any such warning signs elevated for review by officials outside the program by the appropriate officials? If so, what action was taken to address these issues?

Mr. SMITH and Colonel TAYLOR. No. Prior to the Operational Assessment (OA), the EFV underwent extensive developmental and reliability testing. Test data indicated the EFV was meeting the planned reliability growth curve; the last data point prior to the OA measured 14.4 hours vs. a planned 15 hours Mean Time Between Operational Mission Failure (MTBOMF). Despite this 0.6 hour shortfall, the system was assessed to be ready for OA. However, data points during the OA revealed the following shortcomings in the EFV program's previous reliability test program: (1) EFV's mission essential functions were not always utilized during reliability testing; (2) the developmental test profiles did not closely match the operational profiles performed during the OA. When these two factors were included in the pre-OA reliability data, analysis showed the EFV's performance was significantly below the planned curve. Thus, post-OA analysis largely confirmed the OA performance, and pointed out lessons learned to improve future developmental and reliability testing and analysis.

In response to the program's poor performance during OA, during the fall of 2006, the Assistant Secretary of the Navy, Research, Development and Acquisition (ASN (RDA)) chartered an Independent Expert Program Review (IEPR) to examine the EFV program, system, and processes in order to find the root causes of the reliability shortfall and recommend a path forward for the EFV Program. The panel reported that the root causes of poor reliability were: (1) insufficient funding in early SDD that led to inadequate systems engineering rigor in design for reliability; (2) focus on the high water speed requirement, which drove weight and complexity at the expense of reliability, and; (3) an overconfident program advocacy. The panel also cited shortcomings in both government and contractor program organization and management, oversight, and test and evaluation.

During March and April 2007, additional in-depth reviews of the EFV reliability program were conducted by two independent teams of experts commissioned by the Office of the Secretary of Defense (OSD). Each team concluded that the EFV reliability requirement was achievable and that the EFV program was employing the rigorous methods necessary to achieve the requirement.

Mr. TAYLOR. What explains the decision to continue EFV development with the same contractor? What factors led to rejection of conducting a new competition for the new systems development and demonstration phase?

Mr. SMITH and Colonel TAYLOR. The Nunn-McCurdy Certification process resulted in a decision to continue with the current program and address deficiencies by fixing EFV. General Dynamics Land Systems (GDLS) has been the sole EFV vehicle designer and developer since 1996. The main design development and production efforts are planned as sole source to GDLS because no other firm can perform the requirements of development and production without substantial duplication of cost and additional, unacceptable delays to the EFV program. However, the EFV program plans to compete future contracts for certain EFV program efforts, where feasible, to increase performance and reduce program costs.

The factors that led to rejecting a new competition for EFV SDD–2 were cost and capability, as related to the Nunn-McCurdy Certification process. The Nunn-McCurdy review examined three possible alternatives: (1) Fix EFV by continuing with the current program and addressing deficiencies within; (2) Begin a new start by initiating a new program to provide capabilities similar to the EFV; and (3) Upgrade the existing Assault Amphibious Vehicle (AAV).

Regarding the cost factor, the lowest Program Acquisition Unit Cost (PAUC) was associated with the third alternative (Upgrade AAV). The next lowest PAUC was estimated for the first alternative (Fix EFV). The second alternative (New Start) had the highest PAUC due to additional Research, Development, Test and Evaluation (RDT&E) costs.

Regarding the capability factor, the Fix EFV and New Start alternatives would provide equal capabilities, while the Upgrade AAV alternative provides less capability because of its slow speed, lack of firepower, and lack of all-night and all-weather capability. However, pursuing the New Start alternative would unacceptably further delay the vehicle's availability for operational use by the Marine Corps, increasing operational risk to U.S. forces during that period.

The Upgrade AAV alternative could provide the initial upgraded AAVs on the same schedule as the Fix EFV alternative, but due to the slower speed of the AAV, the operational risk to amphibious joint forcible entry operations is much higher.

In summary, there are no alternatives to the Fix EFV alternative which will provide equal or greater military capability at less cost. Initiating a New Start would increase operational risk due to later deliveries and incur more cost; pursuing the Upgrade AAV alternative, while entailing lower costs, would provide less military capability, given the slow speed of the AAV.

Mr. TAYLOR. Who owns the rights to the work done to date on the EFV program? The government or the contractor?

Mr. SMITH and Colonel TAYLOR. The following are the rights to Technical Data and Software under the EFV System Development and Demonstration (SDD) Contract:

Defining Technical Data Ownership

The Government may order during the contract, or within 3 years after acceptance of all items under the contract, any technical data or software generated in the performance of the contract or any subcontract (which expires 3 years after the contractor accepts the last delivery under the subcontract). Generally, if the Government pays for data under cost type contracts, the Government gets unlimited rights to that data. However, with the SDD contract, the Government would have to further develop or procure a technical data package on the vehicle design to support a re-competition of the EFV. A decision was made early in the program not to purchase the Technical Data Package. The EFV SDD contract contains a requirement for the delivery of a final design report. The final report includes information necessary to be able to produce, maintain and provision the EFV. The final report is in contractor format and would not amount to a level three technical data package.

Restrictions on Non-commercial technical data and software per DFARS 252.227–7013

There are three primary restrictions (Unlimited, Government Purpose and Limited) on Non-commercial technical data and software as follows:

The Government receives unlimited rights in tech data for an item, component or process developed exclusively with Government funds. Unlimited rights is defined as: data for an item, component or process developed exclusively with Government funds; studies, analyses, test data or similar data produced for this contract and specified for contract performance; form, fit and function data; necessary for installation, operation, maintenance or training; or data with Government purpose data rights that have expired. The Government receives government purpose rights (GPR) in tech data for an item, component or process developed with both Government and Contractor funds. Purpose rights are defined as: right to use, modify, reproduce, release, perform, display or disclose tech data within the Government without restriction plus release outside the Government for U.S. Government purposes. Also, Government purpose includes competitive procurement. The Government receives limited rights when tech data is developed exclusively with Contractor funds and marked with appropriate legend. Limited rights is defined as: contractor must identify any data it is asserting has restrictions in a contract attachment and not deliver data with markings unless on attachment.

Rights in Non-commercial Computer Software per DFARS 252.227–7014

The Government gets Restricted Rights [versus Limited Rights] to non-commercial computer Software required to be delivered or provided to the Government under the contract if they were developed exclusively at private expense. The difference between limited rights and restricted rights is; under limited rights, the Government's internal use of the technical data is unlimited with the exception of the right to use the data for manufacturing. Under restricted rights, the Government's internal use of the software is only permitted for only one computer at a time with minimum backup copies permitted.

Rights in Commercial technical data per DFARS 225.227–7015

If a particular item delivered under contract is Commercial, the Government typically only receives those rights customarily given in the commercial marketplace to

any commercial buyer. The commercial rights provided for any commercial item typically comes in one of the following three types of rights (Unlimited, Limited, Specially Negotiated):

The commercial marketplace might provide for unlimited rights in a particular commercial item. Under those circumstances, the Government receives data without restrictions; may be in the medium of form, fit and function data; may be in the form of correction or changes to technical data furnished to the contractor by the Government; is data necessary for the operation, maintenance, installation or training (other than detailed manufacturing or process data); or is data to which the Government already has unlimited rights.

The commercial marketplace might provide for limited rights in a particular commercial item. Under those circumstances, the Government receives limited rights in technical data similar to non-commercial technical data. The Government may use, modify, reproduce, release, perform, display, or disclose technical data within the Government only.

Notwithstanding the commercial marketplace, the Government may seek to gain additional license rights with the commercial manufacture through specially negotiated rights. In such a circumstance, the Government and the manufacturer comes to mutually agreeable terms in connection with the specifics of any additional rights provided to the Government.

Rights in Commercial Software per FAR 12.212

With regard to commercial computer software and commercial computer software documentation, the Government shall have only those rights specified in the license contained for the software. This is consistent with the Government receiving a license for commercial software customarily provided to the public.

Patent Rights per FAR 52.227–12

In the performance of a Government contract, the contractor may elect to retain title to any invention created. In such a circumstance however, the Government shall have a non-exclusive, non-transferable, irrevocable, paid-up license to practice, or have practiced for, or on behalf of the United States, the subject invention throughout the world. If the Government retains title to the invention created, then the contractor shall retain a non-exclusive, royalty-free license throughout the world in each subject invention to which the Government obtains title except if the contractor fails to disclose the subject invention within the required time frames provided by law and/or regulation during performance of the contract. As a result, for any patents that might arise during the performance of a Government contract, the Government typically retains at a minimum, a license to use the invention for its purposes.

Validation of Restrictions per DFARS 252.227–7037

A Contractor must maintain records sufficient to justify restrictive markings on technical data delivered or required to be delivered. The Procurement Contracting Officer can request a Contractor to justify markings- pre-challenge. The Procurement Contracting Officer can formally challenge markings.

GD asserted restrictions on technical data and software

It appears that the Government partially funded most of items on GD's list but further investigation would be needed to challenge GD's assertions of technical data rights. These listed items were incorporated by bilateral modification into the contract. The listing does not constitute Government agreement with GD's asserted restrictions on Government rights. However, the Procurement Contract Officer has not challenged GD's asserted restrictions on these items:

- The MTU Motoren-Und-Turbinen Union engine. [**Limited/Restricted**]; The Intercom, hardware and software, developed the Canadian Forces and Computing Devices of Canada. [**Limited/Restricted**]; The vehicle transmission, developed by Allison Transmission. [**GPR or unlimited**]; The azimuth and elevation drive mechanisms, including the controller arm, developed by Missile Systems Division, MOOG Inc. [**Limited**]; The Air Handling Unit (AHU), the Compressor Motor Unit (CMU) and the Nuclear Biological Chemical (NBC) Evaporator, developed by Fairchild Controls. [**Limited/Restricted**]; The Compact Modular Site, developed by General Dynamics Land Systems, Inc. [**Limited**]; Components of the suspension system, developed by General Dynamics Land Systems Muskegon Operations (formerly Teledyne Vehicle Systems). [**Limited**]; Engineering design concepts and interfaces for the High Efficiency Waterjet (HEWJ), developed by Honeywell International Inc. The following drawings are considered proprietary: [**Limited**]; and GDLS process

sheets for the EFV(P) and EFV(C) vehicles containing GD confidential trade-secret manufacturing processes. [**Limited/Restricted case-by-case**].

GD did not identify whether it asserts the Government has Limited or GPR for:

- GDLS life cycle support concept and architectural development initiative which includes but is not limited to internal GD processes and tools; Spray-cool technology, developed by Isothermal Research Company (ISR); The Conformal Antenna (3) technology, the Radio Antenna Interface Unit (RAIU), the HPA/LNA, and the RCS Boot material for the VHF antennas, developed by Ball Telecommunications; The Hydraulic Manifold Components (Pilot Valves, Pressure Switches), developed by Predator Systems, Inc.; The Gyroscopes (MOTS), developed by Fibresense; The Remote Acquisition Control Module (RACM) Sub-components including Power Bus Controller, developed by Vetronics Research Corporation; The VIC Intercom (MOTS); The Commander's Thermal Viewer (MOTS); The Harris HF Radio, Antenna Coupler and Antenna (MOTS); The GPS LNA (COTS); The Electronic Compass (MOTS); The Auxiliary Navigation System (ANS); The Wireless headset (MOTS); The Computing Devices Canada (CDC) Display technology incorporated into the Vetronics displays; The EFV(C) cosite solution; The EFV(C) MMU (COTS).

Conclusion

The Government:

- Is entitled to delivery of a final design report but the report would not provide a technical data package that could be used for a re-competition.
- Could challenge GD technical data assertions but GD is likely to contest these challenges as it will protect their interest in the EFV program.
- Funded much of the development and has government purpose rights but further investigation is required to confirm.

Mr. TAYLOR. What would it cost to terminate the current development EFV contract?

Mr. SMITH and Colonel TAYLOR. Closeout of the existing contract with General Dynamics Amphibious Systems is estimated to cost $70M which was derived during the Nunn-McCurdy Certification process. An accurate cost determination would need to come from a Termination Contracting Officer at DCMA.

Mr. TAYLOR. How much of a delay in getting the first operational EFV to Marines would be caused by terminating the current EFV contract and starting over with a new competition in Fiscal Year 2008?

Mr. SMITH and Colonel TAYLOR. The delay would be at least five years. This is based on assuming a contract award for a preliminary design in FY 2008, followed by a detailed design with a Critical Design Review which would not occur until FY 2010; then fabrication of the new prototypes through FY 2012 with Developmental Test and Evaluation through FY 2014, followed by an Operational Assessment occurring in FY 2016 and subsequent Milestone C if successful. The currently approved restructured EFV Program is scheduled to reach Initial Operational capability in 2015; the earliest estimate for the alternative program is 2022.

Mr. TAYLOR. Has any Department of Defense, Department of the Navy, Marine Corp., or other government agency employee who had oversight or management authority over the EFV program become an employee of General Dynamics after leaving government service? If so, in what capacities did they serve while in government service and in what capacities have they worked for General Dynamics since leaving government service?

Mr. SMITH and Colonel TAYLOR. Yes. General Dynamics has provided a letter to Congress detailing certain individuals that fit this category.

Mr. TAYLOR. Were any design options featuring a "v-shaped" hull considered at any time in the EFV program's history?

Mr. SMITH and Colonel TAYLOR. Yes, but not for mine blast purposes. The dihedral concept was first considered for over-the-water habitability effects from high-speed landings in order to evaluate ride suitability for delivering Marines to battle positions without degrading their fighting capabilities. A Full-Scale Hydrodynamic Vehicle (FSHV) for a future Landing Vehicle Assault of planning hull type served as a technology forerunner to the Advanced Assault Amphibious Vehicle and later became the EFV. The FSHV was tested at Camp Pendleton, California, in 1979. It was determined the inherent form of a tracked vehicle and the nature of tracked vehicle suspensions do not lend themselves to V-bottom designs.

QUESTIONS SUBMITTED BY MR. FORBES

Mr. FORBES. Do you believe that General Dynamics performance justifies the $82 million the company earned in award fees? To put this in a forward looking context, how is the new award fees structured to ensure that the Navy and the taxpayers are not providing awards when the overall performance clearly falls short of expectations?

General GARDNER. From 1996 to 2007, the EFV program's prime contractor, General Dynamics (GD) was paid approximately $1.7B for contract efforts performed during the developmental phases of the program. Approximately $125M of the total has been paid in fees ($43M in base fee and $82M in award fee), representing approximately 8.1 % of the total contract costs incurred to date ($1.53B). GD was entitled to the fee earned in accordance with the stated terms and conditions of each legally-binding contract. The earned award fee was specifically subject to government evaluation of performance in accordance with established criteria at the beginning of each performance period. The criteria varied with each period to target key risk areas particular to that phase of the program. When performance was less than required, award fee was denied. To date, GD has been denied $21M in award fee (they have received $82M of a total $103M available to earn, an average of 79%).

Although EFV reliability performance fell short of the plan for this stage of the program, resulting in an extended development period, many other vehicle performance capabilities have been demonstrated at their required values due to the significant amount of effort performed during the development phase. These capabilities include firepower, water speed, land speed, carrying capacity, and interoperability performance.

The development period included highly complex GD engineering and design efforts associated with developing a combat vehicle that can not only match the M1A1 tank's land speed but can also launch from naval ships 25 nautical miles offshore and transition to the shore within one hour (at approximately 20 knots). In comparison, the currently-fielded vehicle, the Assault Amphibian Vehicle (AAV) launches from ships approximately 2 nm offshore and has a peak water speed of approximately 5 knots. Accordingly, the EFV program determined cost type contracts were appropriate due to the risk associated with the complexity of the requirements. Cost type contracts are typically used at this stage of development in most acquisition programs. The EFV program negotiated Cost Plus Award Fee (CPAF) type contracts (maximum base fee of 3%, maximum award fee negotiable), rather than Cost Plus Fixed Fee (CPFF) contracts (maximum total fee of 10%), to provide a greater incentive to the contractor to prove out advanced technological design solutions and to give the government greater control over fee paid to the contractor. The maximum fee possible on any of the GD CPAF contracts awarded to date is 11.5%, with 3% allocated to base fee and 8.5% allocated to award fee. Of the 11.5% fee available, GD has earned 8.1 %, appreciably less than the 10% the Contractor could have received for a CPFF contract.

The EFV program office recently restructured the current SDD contract award fee provisions. This incorporated objective criteria for cost, schedule and performance based on the program restructure. Specifically, in June 2007, the EFV program successfully renegotiated the award fee provisions for the SDD contract to tie available award fee pools to the successful execution of Systems Engineering reviews and to replace existing, subjective criteria with well-defined objective targets for cost, schedule and technical performance, including demonstration of the ability to achieve the reliability requirement. A multiple-incentive structure was implemented whereby General Dynamics must earn a fee in each category or forgo the fee entirely. This new structure promotes a balanced approach so that no one category is favored to the detriment of the overall performance of the EFV.

Mr. FORBES. Do you believe that General Dynamics performance justifies the $82 million the company earned in award fees? I understand that the contractor did win a large percentage of the incentive award fees, so I would be interested to know what objectives were met to warrant the fees? To put it in a forward looking context, how is the new award fees structured to ensure that we are not providing financial awards when the overall performance clearly falls short of expectations?

Mr. SMITH. From 1996 to 2007, the EFV program's prime contractor, General Dynamics (GD) was paid approximately $1.7B for contract efforts performed during the developmental phases of the program. Approximately $125M of the total has been paid in fees ($43M in base fee and $82M in award fee), representing approximately 8.1% of the total contract costs incurred to date ($1.53B). GD was entitled to the fee earned in accordance with the stated terms and conditions of each legally-binding contract, negotiated in the mid-1990s. However, the earned award fee was specifically subject to government evaluation of performance in accordance with estab-

lished criteria at the beginning of each performance period. The criteria varied with each period to target key risk areas particular to that phase of the program. When performance was less than required, award fee was denied. To date, GD has been denied $21M in award fee (they have received $82M of a total $103M available to earn, an average of 79%).

Although EFV reliability performance fell short of the plan for this stage of the program, resulting in an extended development period, all other vehicle performance capabilities have been demonstrated at their required values due to the significant amount of effort performed during the development phase. These capabilities include firepower, water speed, land speed, carrying capacity, and interoperability performance. Reliability was not achieved since the performance parameters could not be demonstrated consistently through out testing.

The development period included highly complex GD engineering and design efforts associated with developing a combat vehicle that can not only match the M1A1 tank's land speed but can also launch from naval ships 25 nautical miles offshore and transition to the shore within one hour (at approximately 20 knots). In comparison, the currently-fielded vehicle, the Assault Amphibian Vehicle (AAV) launches from ships approximately two nautical miles offshore and has a peak water speed of approximately five knots. Accordingly, the EFV program determined cost type contracts were appropriate due to the risk associated with the complexity of the requirements. Cost type contracts are typically used at this stage of development in most acquisition programs. The EFV program negotiated Cost Plus Award Fee (CPAF) type contracts (maximum base fee of 3%, maximum award fee negotiable), rather than Cost Plus Fixed Fee (CPFF) contracts (maximum total fee of 10%), to provide a greater incentive to the contractor to prove out advanced technological design solutions and to give the government greater control over fee paid to the contractor. The maximum fee possible on any of the GD CPAF contracts awarded to date is 11.5%, with 3% allocated to base fee and 8.5% allocated to award fee. Of the 11.5% fee available, GD has earned 8.1%, appreciably less than the 10% the Contractor could have received for a CPFF contract.

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Mr. FORBES. How can the Secretary of the Navy certify to Congress that no alternatives exist to the program as required by a Nunn-McCurdy certification, while also requiring the Marine Corps to develop a plan for an alternative program should the risk mitigation plan fail?

General GARDNER. The Nunn-McCurdy certification pertained to the context of existing alternatives, based on the Joint Requirements Oversight Committee (JROC) affirmation of the need for a high-speed amphibious assault capability. Secretary Krieg's decision to certify that no alternatives exist included careful consideration for the element of time. That is, he found that no alternative program could deliver the same capability in a reasonable time, compared to the EFV program. For example, the restructured EFV Program is scheduled to reach Initial Operating Capability (IOC) in 2015; the earliest estimate for an alternative program is 2022. Consequently, under scrutiny, the EFV Program was certified and restructured to mitigate the risk in acquiring the defined capability. As a prudent initiative to further address the potential program risks, despite the newly proposed timeframe and available resources, the Acquisition Decision Memorandum ADM directed the development of an "alternative way ahead"—a contingency plan in order to have an option "if the risk burn-down plan for EFV is not successful."

Mr. FORBES. How can the Secretary certify to Congress that no alternatives exist to the program, while also requiring the Marine Corps to develop a plan for an alternative program should the risk mitigation plan fail?

Mr. SMITH. A Nunn-McCurdy certification pertains to the context of existing alternatives. Based on the Joint Requirements Oversight Committee's affirmation of the need for a high-speed amphibious assault capability, Secretary Krieg's decision to certify that no alternatives exist included careful consideration of the element of time. That is, no alternative program could be executed and deliver the same capability in a reasonable time, compared to the current EFV program. The restructured

EFV Program is scheduled to reach Initial Operating Capability in 2015; the earliest estimate for an alternative program is 2022. Consequently, under scrutiny, the EFV Program was certified and restructured to mitigate the risk in acquiring the defined capability. As a prudent initiative to further address the potential program risks, the Acquisition Decision Memorandum directed the development of an "alternative way ahead" in order to have an option if the risk mitigation plan for EFV is not successful. Note that the alternative does not propose a completely new vehicle, since much of the design has proven to be sound, but addresses the higher risk parts of the program.

Mr. FORBES. How have the wars in Iraq and Afghanistan changed the Marines Corps' plan for providing mobility once Marines get ashore? How is the Marine Corps' balancing its two missions of amphibious assaults and participation in long-term, irregular warfare?

General GARDNER. Lessons learned from operations in Iraq and Afghanistan, past Marine Corps operations, and operations conducted by other services and nations, combined with the 2006 Strategic Planning Guidance (SPG) tasking the Marine Corps to "consider an appropriate mix of vehicles to support irregular operations" have shaped our tactical ground mobility portfolio. Mobility for Marines ashore will continue to be provided by the Marine Air Ground Task Force through air and ground systems; however the most significant change in our plan for providing future ground mobility stems from force protection requirements generated by the current Improvised Explosive Device threat. Force protection, amphibious lift and range, night vision, speed, adequate firepower, strong reliability, and ease of maintenance have always been key characteristics of Marine Corps ground mobility, but the level of armored protection required in all future ground mobility systems is now a main component driving both operational and acquisition planning.

Amphibious forcible entry operations are maneuver operations where lethality and survivability are measured to some extent by our ability to disperse or concentrate forces. While ability to maneuver remains a factor in irregular operations, two other facets have forced a change in requirements placed on Marines and their equipment. First is the necessity to maintain proximity with the population. Second, maneuver is constrained when Marine forces move into more populated areas where their activities, tactics, and vulnerabilities can be discretely observed by an enemy who specializes in blending with the population. Faced with this new limited ability to maneuver, we found a need to adopt tactics and subsequently, reevaluated our vehicle requirements. The Marine Corps is balancing our two missions of amphibious assaults and participation in long-term, irregular warfare by shifting from a largely singular focus on amphibious forcible entry to a mix of platforms that have application across the range of military operations. We have tailored our Expeditionary Fighting Vehicle investment to be consistent with the SPG and have initiated the Marine Personnel Carrier and the Joint Light Tactical Vehicle programs, both of which seek improved performance and payload while providing vehicle occupants with enhanced protection against the ubiquitous threats of mines and IEDs that characterize operations where constrained maneuver forces us to operate in areas in spite of the known hazards.

We will continue to pursue a balance of vehicles that will enable our Navy-Marine Corps team to increasingly provide a persistent and flexible forward presence, both afloat and ashore, to meet combatant commanders' growing requirements for general purpose forces. Our future mobility systems will enable us to more effectively engage in low-end shaping, deterrence, and security missions while also positioning us to respond to high-end combat and forcible entry amphibious operations.

Mr. FORBES. How have the wars in Iraq and Afghanistan changes the Marines Corps' plan for providing mobility once Marines get ashore? How is the Marine Corps' balancing its two missions of amphibious assaults and participation in long-term, irregular warfare?

Colonel TAYLOR. Mobility for Marines ashore will continue to be provided by the Marine Air Ground Task Force through air and ground systems. The 2006 Strategic Planning Guidance (SPG) tasked the Marine Corps to "consider an appropriate mix of vehicles to support irregular operations." It is that task, combined with lessons learned from operations in Iraq and Afghanistan, as well as lessons learned by past Marine Corps operations and operations conducted by other services and nations, that has served to shape our tactical ground mobility portfolio. The largest change in the Marine Corps' plan for providing future ground mobility stems from the force protection requirements generated by the current Improvised Explosive Device threat. Force protection, amphibious lift and range, night vision, speed, adequate firepower, strong reliability, and ease of maintenance have always been key characteristics of Marine Corps ground mobility; but the level of armored protection re-

quired in all future ground mobility systems is now a main component driving both operational and acquisition planning.

Amphibious forcible entry operations are maneuver operations where lethality and survivability are both measured to some extent by our ability to disperse or concentrate our forces. While the ability to maneuver remains a factor in irregular operations, two other factors influence these operations and force a change in the requirements placed on the Marines and their equipment. The first is the necessity of proximity. Positively influencing populations require that our Marines remain close to that population. In doing so, the second factor, constrained maneuver, is introduced. Marine forces move into urban areas, or at least those areas that are more populated. In doing so, their activities, their tactics, and their vulnerabilities can be discretely observed by an enemy who specializes in blending with the population. Faced with a limited ability to maneuver, tactics must be adopted to changing situations and equipment developed and fielded to support forcible entry operations, particularly from the sea, may become less suitable when faced with constrained maneuver. It is these conditions that caused the Marine Corps to reevaluate its vehicle requirements and ultimately caused a shift from a largely singular focus on amphibious forcible entry to a mix of platforms that have application across the range of military operations. We have tailored our Expeditionary Fighting Vehicle investment to be consistent with the SPG and we have initiated the Marine Personnel Carrier and the Joint Light Tactical Vehicle programs, both of which seek improved performance and payload and are planned to provide vehicle occupants with enhanced protection against the ubiquitous threats of mines and IEDs that characterize operations where constrained maneuver, forces us to operate in areas in spite of the known hazards.

In order to ensure the Marine Corps remains the most ready when the nation is least ready, our weapons, vehicles, and aircraft—the tools of our trade—must be sufficiently flexible to support operations across a wide spectrum of conflict. In the case of ground mobility systems, we will continue to pursue a balance of vehicles that will enable our Navy-Marine Corps team to increasingly provide a persistent and flexible forward presence, both afloat and ashore, to meet the combatant commanders' growing requirements for general purpose forces. Our future mobility systems will enable us to more effectively engage in both low-end shaping, deterrence, and security missions while also positioning us to respond to high-end combat and forcible entry amphibious operations.

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