

Testimony of Vice Admiral (retired) Michael J. Connor
before the
United States House of Representatives Armed Services Committee
Sea Power and Projection Forces Committee Hearing
Game Changers – Undersea Warfare
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Chairman Forbes, Ranking Member Courtney, members and staff, thank you for the invitation to speak here today on the topic of game changers in undersea warfare. I also want to thank all of you on this committee for the support that you provided to the Submarine Force during my tenure as commander for three years from 2012 to 2015. The long term commitments that you made to the shipbuilding program created the foundation for the consistent superior performance of the Virginia class program which continues to deliver submarines ahead of schedule and under budget.

That type of support will continue to be important going forward because dominance in the undersea domain will be even more important in the future than it has been in the past. In today's world, control of the undersea is a necessary prerequisite to sea control and joint force access in the maritime arena. Therefore it underpins commerce, protection of natural resources and homeland defense.

The undersea arena is the most opaque of all warfighting domains. It is easier to track a small object in space than it is to track a large submarine, with tremendous fire power under the water. That is why countries with the technical wherewithal to operate in this domain are pursuing advanced capability. The two countries that present the biggest challenge in the undersea are Russia and China, with Russia being the more capable of the two.

With both Russia and China pursuing territorial expansion at the same time they are delivering much improved submarines with more advanced weapon systems, now is a good time to sustain our advantage in the undersea, and leverage that advantage with game-changing capabilities. This hearing topic shows that this committee understands this. Therefore I would like to continue with some recommendations as how this committee can help deliver those game-changing capabilities.

You will be happy to know that the Navy has a strategy to guide their way ahead in the undersea. I briefed some of you on that strategy earlier this year in a classified setting.

First, we need to continue our commitment to having the best submarines. The side with the quietest submarines with the best sensors has both tangible and intangible advantages. The tangible advantage is simple the ability to strike your foe at a greater range than he can strike you. The intangible advantage is even greater. An adversary that never really knows if there is a submarine in the area, and capable of striking on short notice, can never have confidence that they can control the sea. Many of you know from your closed hearings that we have significant advantage with our submarines against potential foes. The question for today however, comes down to whether we are fully leveraging that advantage with the right type of payloads to achieve a full effect.

The first step we need to take, and are taking, is to extend the striking range of our submarine-launched weapons. This multiplies the impact of each submarine and multiplies the search challenge that each submarine presents to a potential foe. In the case of torpedoes, we should be pursuing a design objective of an effective range in excess of 100 miles. This is definitely doable with chemical-based propulsion systems and will likely soon be achievable with battery systems. To effectively leverage this range, we need enhanced command and control systems, including the ability to communicate with a torpedo at a range of 100 miles. It is very likely that in the future the final instructions for a submarine launched torpedo will come via manned or unmanned aircraft, or via satellite. The torpedo will come to be considered along the line of a slow moving missile, with the advantage that it is more difficult to detect, carries a much larger explosive charge, and strikes the enemy beneath the waterline, where the impact is most severe.

The next step we need to take is to get back into the business of submarine-launched anti-ship missiles. We abandoned that capability about 20 years ago because we had difficulty with the technology of the day ensuring that the missile would hit only the desired target. Command and control technology has improved a lot since then. US industry has today, the ability to build an anti-ship missile that can be launched from a submarine (or a surface ship) and confidently attack a specific target at sea at a range of about 1000 miles. We should be pursuing this more aggressively than we are. The impact would be enormous. While the destructive force of a missile is far less than that of a torpedo, a missile will often render the adversary combat ineffective. Further, when you combine a stealthy submarine with a long-range missile, you put the adversary in the position of having to maintain an air-defense posture whenever there is a possibility that a US submarine might be within missile range. That requires the enemy to replace many of his offensive weapons with defensive weapons. It

requires him to operate air defense radar systems, making him easy to detect. It also requires him to aggressively respond to the slightest indication that there may be a submarine in the area. In other words, extending the striking range of a US submarine is a cost-imposing, asymmetric improvement. I would note that many of those same advantages accrue to a surface ship employing a long range weapon. That is why the surface force and the submarine force are working together to close that gap.

Next, we need to expand the rate at which the force gathers information to inform both strategic and tactical decisions. It needs to be done at greater ranges and in multiple locations. This will be the job of unmanned vehicles—in the air, on the sea and under the sea. As you know, the submarine force achieved an important milestone this year with the operational deployment and recovery of unmanned vehicles doing a series of missions that would have been either impossible or untenable from a risk perspective. That was an important milestone, but it was only the first of many milestones that must be achieved. Going forward, we need to improve the endurance of the vehicles, expand the payload set, and get to the point where any submarine can recover the mission data, if not the vehicle. We need to do this while keeping the cost of the vehicle down. The cost should be low enough such that, while we would always like to get the vehicles back, it is not a crisis if we don't. The value is in the data, not the vehicle.

Unmanned vehicles that produce game-changing effects in the undersea domain include many vehicles that would be deployed by other means than submarines. The key is that we need to expand the number of sensors we can place in the field, and develop the means of harvesting the output of those sensors. To the extent that we succeed in this area, we make each of our capital assets--our submarines, ships, and aircraft-- that much more effective. This will be a system of systems approach. The particular systems that we should use will vary as a function of the environment and the mission. For example, some systems are well suited to deep water and others to shallow water. We will need to build the systems and then create an easy to understand output for the fleet commanders that is common to all sensors. In fact, the information architecture that displays the output of undersea systems would ideally be common with those hosting the output of any other surveillance and reconnaissance system. We don't operate this way today, but we should in the future. If we do this right, we will keep our expensive and over-tasked ships, submarines and aircraft focused on doing the types of things that only they can do or should do. We should to a large degree turn over the role of search to unmanned systems. The opportunity space here is huge for both government and industry. Next, I would like to talk to you about how you can help the Department of Defense, and the defense industrial base make that happen.

There are a number of game-changing programs that are under way. They were funded, in part, on the omnibus reprogramming earlier this year. We appreciate the efforts of the authorizers and appropriators in the House and Senate that made that happen. That effort

greatly expands our use of groundbreaking unmanned sensors to solve near term problems. It has unleashed a wave of energy and creativity in the system development community. That effort will be fielded in 2016 and key milestones along the way to fielding are being met.

That brings me to the larger picture of how the Department of Defense and the Congress can work together to develop undersea technology at a pace that keeps us ahead of peer competitors and allows progress at the rate that American technologists can produce it. Game changing breakthroughs will not be permanent solutions. Rather, they will be a competitive advantage that will last for a finite period of time. The future will require an innovation cycle that produces game changing solutions again and again.

The Federal Budget Process is slow and time consuming. I don't need to remind you of that—especially this week. The Department of Defense will spend a year developing a budget for submission to the Congress. It is typically delivered in February. Congress spends 6-9 months approving and modifying it for submission to the President, with no guarantee that it will not be vetoed. Sometimes we have short term continuing resolutions to keep basic functions operating, although no new starts or innovation projects are permitted to begin during the duration of the continuing resolution.

The issue is that we need a method to keep the pace of innovation alive in a world in which the technology cycle is only 2-3 years. If we work each new idea and proposed program via a specific new proposed line item in the budget, each new game-changing initiative will consume an entire technology cycle awaiting budget approval. In a world in which the pace of technology is fast and getting faster, one of our crucial strategic advantages will have to be the ability to innovate faster than our adversaries.

Help from Congress in sustaining rapid innovation despite the realities of the federal budget process requires the following steps:

First, Congress should provide innovation funding that is not tied to specific programs of record.

Second, programs should be defined broadly so that they can incorporate innovation without recreating the program. This process is already working well in the submarine combat system area, but needs to be incorporated in the torpedo area as we begin a much overdue heavyweight torpedo production restart.

Third, we should have the ability to recognize failure when we see it and cut our losses. If we are innovating aggressively enough, perhaps half of our initiatives will fail. We should embrace that failure, cut funding to the program, and apply that funding in other endeavors. Of note, in the most innovative area on the planet, Silicon Valley, that failure rate approaches 90%. You see failure often, usually when a program manager comes to you with a proposal for 'restructuring.' Sometimes a request for restructuring really means that the underlying technology or operating concept did not work. When that is the case, it is time to learn the lessons and move on.

Fourth, if we are to truly harness the innovation of this country, without breaking the bank in innovation research, we need to ensure that we provide a means for companies in the private sector to keep control of their intellectual property and harvest the profits when we find their innovations useful. That provides the incentive for private investment, which tends to be much more efficient than government innovation investment. There has never been a better time than now, as much of the technology that was developed in the energy, communications, and academic research sectors can be applied to the defense sector with minor modifications.

Once again, I would like to thank you for the opportunity to speak here today and I wish you well as you endeavor to support game changing innovation in the undersea arena. I would be happy to answer any of your questions.