

THE SUBMARINE REVIEW



JUNE 2016

2016 CORPORATE MEMBER RECOGNITION DAYS

KEYNOTE ADDRESS:

Assistant Secretary of the Navy
(Research, Development
and Acquisition)

The Honorable Sean Stackley 8

CORPORATE MEMBER RECOGNITION PRESENTATIONS

Breakfast Address:

Deputy Chief of Naval Operations for
Integration of Capabilities &
Resources

VADM Joe Mulloy, USN 27

Commander, Submarine Forces

VADM Joe Tofalo, USN 55

Director, Submarine Warfare,
OPNAV

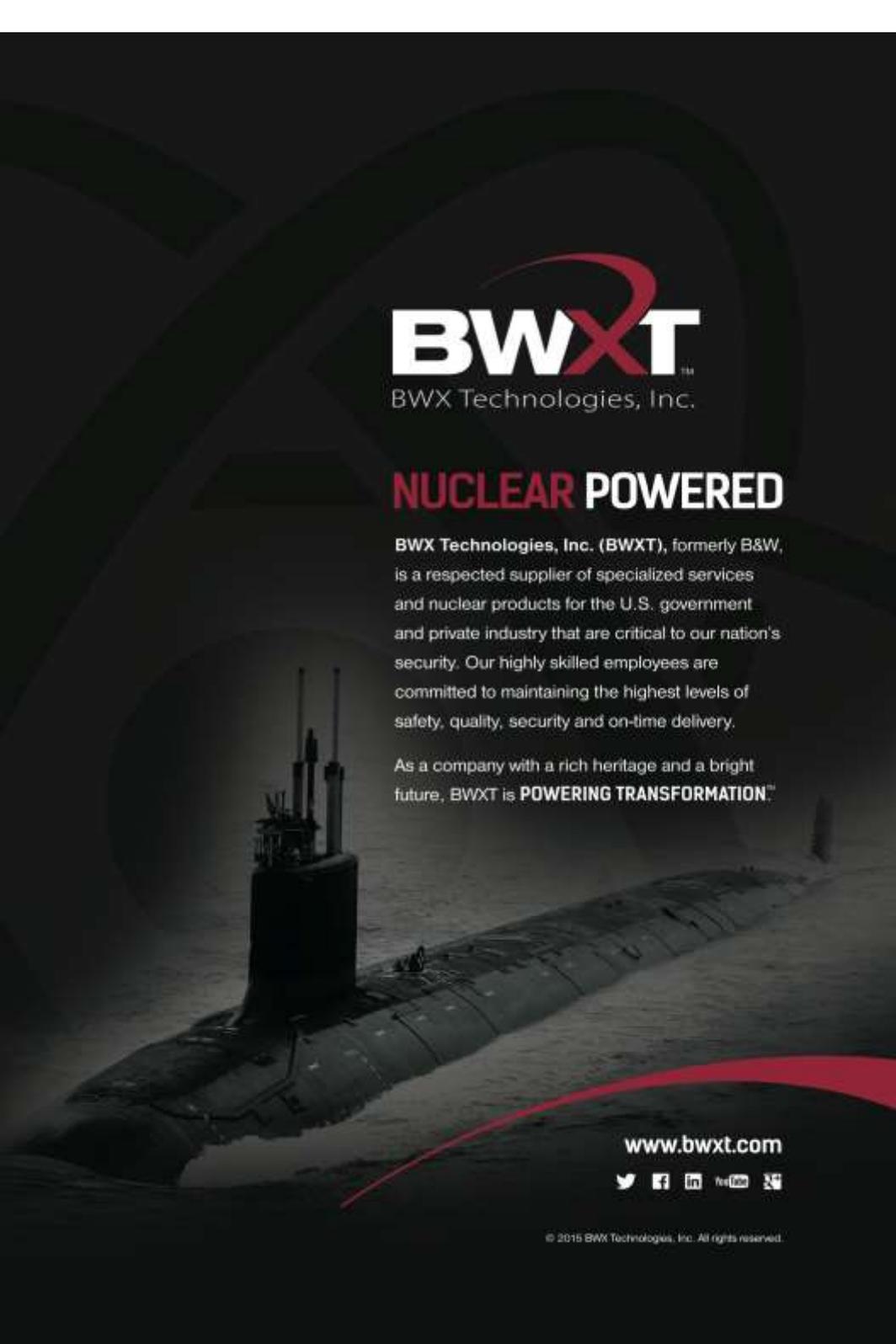
RADM Charles Richard, USN 83

Program Executive Officer,
Submarines

RADM Michael Jabaley, USN 104

Commander, Submarine Force,
Pacific Fleet

RADM Fritz Roegge, USN 129



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EDITOR'S COMMENTS

This issue of THE SUBMARINE REVIEW is dedicated to the recent presentations given by the leaders of the Navy's Submarine Force both civilian and uniformed. The scope of effort needed to produce the Force required for our national security, both now and in the foreseeable future, is immense and the pace which is necessary to keep that Force up to the strength capable of success in the tasks set by national leadership is indeed daunting. To support those efforts, this magazine is providing both a written record of the presentations given at the League's Corporate Member Recognition Days this Spring, and the information, both specific and general, to enable readers to discuss and support the critical current Submarine Force issues as they come to be addressed by the national authorities. This is a densely-packed, information-rich, group of presentations which is unique in its focus on acquisition and its breadth of coverage on technological employment.

This compendium is very aptly led off by the Honorable Sean Stackley, Assistant Secretary of the Navy for Research, Development and Acquisition. Accompanying Secretary Stackley's address of time, objectives and process, there are two aspects to which this magazine recommends the particular notice of those not familiar with the way the submarine community does its business. The first of those aspects is in the Introduction given by Admiral Kirk Donald, the Chairman of the League's Board of Directors. He spoke of "the respect for the dissenting view", "having the facts straight" and "Once the hands are stacked, the decisions are made, there's no daylight." The second aspect of note is implicit throughout Secretary Stackley's comments and that is detailed, and complete, recognition of, and compliance with the system of process set up for program development, review, approval and execution.

One of those processes has to do with the budget, and it is an important part of the Capabilities side of the Requirements/Capabilities equation that decides the fate of Planning and



Programs. VADM Joe Mulloy, the DCNO for Integration of Capabilities and Resources, presented a summary of that process and its major considerations. It is budgetary understanding that makes sense of everything done in Defense acquisition. This is must reading for all who wish to participate in/comment on the issues affecting the future of the Submarine Force.

Also of particular note for those outside of the submarine community, as well as for more up-to-date understanding by those with long experience in the submarine community is VADM Joe Tofalo's explanation of the elements, and process, involved in detailed planning for the Submarine Force. As Commander, Submarine Forces, he is responsible for keeping the entire Undersea Warfare Enterprise in focus and on course. It is up to all of us to know there is a plan, it is written, and it is published throughout the Undersea Warfare Enterprise.

The execution of that plan is discussed by Rear Admirals Richard, Jabaley and Roegge. Their responsibilities are, respectively and generally; Finance, Production and Operations and each is a complex and broad area which requires all the skill and hard work which can be brought to the task. It is an integrated and focused whole. As Admiral Donald put it, "...the facts are straight" and "...there's no daylight"

Jim Hay
Editor

FROM THE PRESIDENT

Spring has arrived and with it, Novak Djokovic has completed a career *Grand Slam* by winning the men's French Open Tennis Tournament, the National Basketball Association and National Hockey League Finals are underway, the long suffering Chicago Cubs lead the Major Leagues in wins and look like a good bet to be playing late into the Fall, and, as this letter is written, the Boston Red Sox are in first place in the American League East!

Oh, yes, lest we forget, the President's Budget Submission is on Capitol Hill, where it is being sternly scrutinized by Congressional Authorizers and Appropriators in a harsh fiscal climate in the midst of a contentious legislative season during what is certain to be an interesting and hard fought election year that includes choosing a new President.

Support for the Department of Defense Budget Submission generally has been solid, with Combatant Commanders forcefully making their case for the capabilities and resources needed to execute day to day operational commitments while preparing for anticipated contingencies in a dynamic and dangerous international environment. Service Secretaries and Acquisition Executives have spoken forcefully about the need for investment while sustaining current capability and the quality of our military forces.

From the perspective of the US Submarine Force, the message is clear: The OHIO Replacement Program (ORP) is the Navy's top priority and the VIRGINIA Class Submarine (VCS) Program is the top performing program within the Department of Defense. US Submarine Forces are well trained, well maintained, and are being continually modernized to ensure optimal combat capability. Forward deployed and ready, the strategic Submarine Force provides a secure and resilient survivable deterrent against nuclear aggression and the attack Submarine Force provides agile, responsive and flexible combat capability in all the world's oceans.

The value of the US Submarine Force is well known and deeply appreciated by our Defense Department and Congressional

leadership. The wise and cost effective investment enabled by earlier Congressional action has ensured today's submarines are materially and technically modernized and combat capable across a broad spectrum of warfare. The wisdom of this investment, and the combat capability it has provided, serves as an instructive model going forward. Lessons learned are being incorporated into the ORP design to optimize construction efficiency and minimize life cycle costs. The VCS Program continues to improve its acoustic stealth and the VIRGINIA Payload Module (VPM) will enhance combat capability beginning with the ships in VCS Block V. Our submarine builders and the profoundly productive and innovative Submarine Industrial Base that supports them continue to improve upon a quality product, providing exceptional value at minimal cost, on time and on budget.

This issue of THE SUBMARINE REVIEW highlights the remarks of our Navy leadership during our Corporate Members Days held this past March. The perspective these remarks provide, from the waterfront to the Pentagon to the Navy Yard, demonstrates a focus of purpose and tenacity of effort that is reflected throughout the US Submarine Force. These remarks succinctly declare where we are today and where we are headed in the future. They should be carefully read by all who value and support the missions executed by the superb men and women who operate and maintain the finest submarines in the world, around the world, every day.

And the future, uncertain but certain to be demanding, looks bright. The Naval Submarine League's classified Submarine Technology Symposium, held at the Johns Hopkins University Applied Physics Laboratory in May, was a tremendous success and addressed some of the technology and capability available to be incorporated into our submarines. Superb platforms, integrating innovative technology and operated by dedicated and resourceful personnel, will continue to perform exceptionally well while addressing the challenges that await.

As has been written on this page before, 2016 will be a year of challenge and change and the Naval Submarine League will strive to keep its membership and the public engaged and aware of

salient US Submarine Force issues. Ours is the world's most capable undersea force in the world's finest Navy. This will continue to be the case for the foreseeable future

I am privileged to join with all who support the Naval Submarine League as advocates for a strong US Submarine Force. I thank you all and encourage you to recommend membership to your shipmates, friends and colleagues.

With Memorial Day just past, it is appropriate to remember the sacrifices that our military personnel are prepared to make every day in defense of our Nation and the freedoms it ensures. Please keep them in your prayers.

John B. Padgett III
President



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2016 CORPORATE MEMBER RECOGNITION DAYS

**NAVAL SUBMARINE LEAGUE
2016 CORPORATE MEMBER RECOGNITION DAYS**

**ASSISTANT SECRETARY OF THE NAVY
SEAN STACKLEY**

LUNCHEON SPEAKER

March 10, 2016

Introduction by Admiral Kirk Donald, USN, Ret.

I thought that in the vein of an introduction, I wanted to share with you my experiences with Secretary Stackley and maybe give you some insight into just what he has meant to the Submarine Force and to the Navy during his tenure as the Assistant Secretary of the Navy for Research, Development and Acquisition. It really goes back to the beginning of his term when he first assumed the office. At that time, you'll remember, there were a lot of things that were going on.

We were embryonic in the beginnings of the Ohio Replacement Program, getting to two per year for Virginia was a real challenge, trying to achieve that, VPM was just a twinkle in somebody's eye, not to mention all the other things that were going on in the Navy outside of what the Submarine Force is all about. But when Secretary Stackley got into his office, as an astute observer, he saw that there was a significant amount of work that had to be done to get these programs ready for prime time, if you will. He did what a great acquisition executive would do, recognize the threat vector and then proceed to dig in, and that he did.

I would characterize it in this way, there are two pieces to Secretary Stackley. He can at one time be your harshest critic and greatest skeptic, and he demonstrated that in those early days. And there are folks in this room that remember that, remember it

vividly, the Dave Johnsons, the Willy Hilarides, the Steve Johnsons, Terry Benedict, Kevin McCoy, Paul Sullivan and a host of N97s who sat through some very, very difficult challenging meetings where in the finest tradition of what the Submarine Force has done, the stakeholders marked their positions and then they proceeded to drag each other to the truth. And these were some tough meetings, heated, passionate. I think we had first names substituted with expletives, where parental lineages were questioned.

But what it really reflected was something that's wonderful about the Submarine Force and the programs, it's the respect for the dissenting view. It's the respect, the acknowledgement of the dissenting view, the value placed on that, and then arriving at solutions. And Secretary Stackley's approach to capabilities, requirements, affordability, all of that helped us arrive at the positions you have all heard from the acquisition executives that have been here today. But also, look at what has resulted from the support that we've received and how well the programs are doing as a result of having the facts straight, having commitments. Once the hands are stacked, the decisions are made, there's no daylight.

And the other side of being your toughest critic and your greatest skeptic is when all that hard work, that passionate work is done, when it comes time to represent that to the Navy, to the administration, and to the Hill, you take someone with Secretary Stackley's credibility from the get-go in those environments, and add to that a well-founded argument about why this is the right thing to do, it's a thing of beauty. It's a real thing of beauty to see how it has all worked out. We couldn't have done it without him. We couldn't have had the success we've enjoyed, and it doesn't stop now.

As we've discussed, we're at an inflection point. The going is going to get tougher. The old arguments that have been won will be new again. We'll have to go and make sure that we're in execution. And I am absolutely confident that that passion, that rigor, that dissenting view and respect for the dissenting view, will continue.

So with that I want to first thank you. Thank you for all that you've done, and offer you the podium to share some words of wisdom to us.

Secretary Sean Stackley:

Good afternoon. This will not be a pep rally session. We've got a lot of work to do. In fact, I'm concerned when I look about this audience here, I'm wondering who's back in the shipyards getting the work done.

Kirk, I'll be honest, I'm looking forward to getting my first name back. The expletive deletes are—they are what they are. I'm sitting here staring at Jeff Geiger. Jeff and I have worked together now for over a quarter century on some tough projects, some challenges that looked like they were insurmountable, some pretty dark days. Yet one by one, we took these huge problems and broke them down into much smaller solvable problems and finally got to the target that we were aiming for.

I'm saying that now because we've got some huge challenges ahead, really huge, but really they're opportunities. On the one hand they are opportunities. On the other hand they are compelling needs, and I'll talk about that a little bit.

First, seriously looking about the room, and I say this from the heart, the talent that is in this room right now covering every end of the spectrum, all things submarines, there is not a problem or a challenge out there that you all—government, industry, military, civilian—working together can't solve, can't overcome, can't best. When I talk about where we're going, and I'm probably going to repeat words that Joe Mulloy probably described earlier this morning, and the other speakers, it's going to require your best. It's going to require everybody's best here and it's also going to require that we are all pulling in the same direction.

I don't think that part will be a challenge. I think this group has been pulling in the same direction throughout your professional careers. What I'm talking about is pulling a little bit harder moving forward.

I'm going to talk a little bit about the state of the Navy, exhaust you all on another view of the budget outlook, and then what

I call knowing the right moment. Pythagoras: “Know the right moment.” We’ve got the right moment coming up, and I’m going to highlight that a bit.

First, operations. If you work in the Pentagon and you work the budget machine, everything that we look at, everything that we discuss, everything that we propose, ends up on a PowerPoint slide, probably a quad chart. At the bottom of that quad chart, it’s going to say, cricket. It’s going to have a little box next to it and it’s going to be red, yellow or green, and it’s China, Russia, Iran, Korea and terrorism, and everything that we do is being measured against that.

The challenge that we’ve got is the budget doesn’t flex as the threat flexes. So as we’ve gone through—going back over the various POMs up until this ’17 budget that’s been delivered to the Hill, the budget has been flat, at best. In constant year real dollar terms, it has been going down, but the threat has been going up. The threat has been going up, and it’s well known.

What we’re trying to do is balance a program, where a program is everything from people to hardware to operations to advanced capabilities, against a rising threat. If you look back about three years ago, sequestration is coming, the Budget Control Act is coming, the world is coming to an end. The service chiefs are going over their briefings and they’re looking at the budget outlook. One by one, they articulated that we’re at the floor. We’re at the floor in terms of risk. If the budget goes any lower, we won’t be able to meet our requirements in terms of the defense strategic guidance. That was about three years ago.

But the budget has gotten lower. It has gotten lower. What this budget dialogue with the Hill has turned into is a discussion of risk. The Hill is pretty tired of talking about risk. It has come to realize that risk is a very bendable measure in terms of capability, requirements, the threat. So the Hill is going about doing their own assessment.

I was describing to another group earlier this week—I went over a couple of days ago and talked to each of the staff directors. They used their recess to go out and visit the force. They went out, they wanted to talk to troops. They wanted to talk to sailors. They

wanted to take a look at hardware. They wanted to visit the fleet in theater. They went down to the depots. And they came back with their own assessment because they knew what they would get when presented the president's budget, they would get some dialogue about risk, acceptable, where the other alternative is obviously unacceptable, and they wanted to come up with their own assessment.

Their assessment, unsurprisingly, is pretty bleak. It's bleak. It reflects a force that has been driven hard, tired iron, aircraft that is exhausted, depots that are overloaded. They see ships and aircraft that deployments are being stretched. They understand the rising threat and they also understand, as they look across all of this, that they are part of the problem.

What we're doing is we're asking more for less from the force inside this Budget Control Act environment. Even the BCA that a couple of years ago was being touted as a breakthrough because we've got stability, yeah we do have stability, we have stability at a lower budget. So let's not cheer too loudly.

So now they're taking a step back. They're assessing, where are we today and where do we need to be? They understand the box that they put us in in terms of the BCA and they're starting to get a better appreciation of the impacts of that budget on the force. They're also wrestling with what we are talking about inside of our own five walls in the Pentagon, which is if you take the budget environment that we're in and you take those cricket assessments, then a couple of things have emerged this past cycle.

One is a discussion about posture versus presence. This one gets a little bit emotional. From the CoComs perspective, if you ain't got presence then you ain't got posture. They've come over in closed discussions and also in hearings to try to refute the notion that you can maintain a degree of posture back in the states and that will satisfy their need in theater. And so they're arguing pretty hard for presence. Of course, presence drives the build, and so there's a thought process inside the building that you can reduce presence, increase posture, reduce your bills, and still maintain deterrence. That's being pretty heavily debated right now.

The other aspect that has emerged in this budget is being called the third offset strategy. Deputy Secretary Work, he's kind of brought this strategy forward and he's put a lot of thought into it. In many ways, it makes great sense. It makes great sense. When you look at the threat and you look at the rate of rise of the threat's capability, when you look at where we are today and what do we need to do to maintain the upper hand, particularly when you're talking about laws of large numbers when you deal with a major combat operation, he's looking for that third offset in the future that will give us that sustained superior capability.

To be honest, the Hill doesn't understand what it is. They don't understand what it is. They understand it's investing in future advanced capabilities. They're kind of looking for it in the budget, but they're not becoming enamored by it. They're not becoming enamored by it.

They consider mass to be very important. They do consider presence to be very important, and that starts to translate into things like force structure. And much of the rest of my time here is to talk a little bit about force structure.

That's the Hill, that's the budget, that's all I want to talk about on those. If you have questions on that there's a bunch of other issues that will be brought up on the Hill that I beg you all not to pay too much close attention to. One of them is acquisition reform. I think we've exhausted that topic.

There's an alternative carrier study. Is Matt Mulherin here by any chance? No, okay. I was down at Newport News on Friday and he wanted to get my insights into where we're going with the alternative carrier study.

This is precious to us. Carriers are the ultimate in terms of low density, high demand assets. The alternative carrier study was given birth by Senator McCain. He's looking at the trends in terms of aircraft carrier cost. He's looking at trends in terms of A2AD, and he's looking for the Navy to come back with some alternatives.

So we've launched a study and will dutifully report that out this year, but there's not a pony in there. We shouldn't be looking

for a pony in there. The 10th carrier air wing is going to be one of the issues that Congress wrestles with.

And then the other one that you all are quite familiar with, the National Sea-based Deterrent Fund. The last thing I did before coming over here was hearing preps with the secretary. We spent a good bit of time walking through the script for answering the questions on the National Sea-based Deterrent Fund because the different committees have different positions.

If you're talking to the appropriators, you have to have one answer for all four committees. And all four committees, when you give them that answer, they have to hear what they want to hear, but you have to get what you want to get. It's a bit of a trick, but we're working it.

The last thing about the Hill in this budget cycle is it's an election year. And so with everything else swirling around: the threat, the topline, BCA, it's an election year. And so we may tend to very practical concerns such as; will we get a budget, and when will we get a budget; you can bet that we will not get a budget by the first of October. So you have to start to factor in what impacts will that have in terms of execution? Although sadly, we're becoming pretty practiced at operating under a continuing resolution.

Force structure, everybody here should be familiar with CNO's force structure assessment, last updated in 2014, 308 ships. In fact, we will hit 308 ships in 2021. Come hell or high water, we're going to get to 308. I can say that confidently because we have 65 under contract and construction right now. So if we don't authorize and appropriate another ship between now and 2021, we'll be at 308 in 2021.

The flip side of that is every ship that we request from this day forward is shaping the Navy beyond 2021. So what is the Navy going to look like in 2022? Well, that's going to be our 2017 budget request. In the five years after 2021, that's the FYDP that we just put on the Hill, and on and on.

So it's 308, which if I was having lunch with Secretary Lehman, he would say you've got a half sized Navy. But 308, that being the requirement, gets there in 2021. The real issue we're

debating about right now is what the Navy will look like beyond that.

So we've submitted a 30 year report to Congress. Everybody should be familiar with that. When you tear open the 30 year report to Congress, we've got a lot of shortfalls that start to emerge after 2021. So we climb for a decade to get up to a 300 ship Navy. We get up there, we hold it for a brief period, and then we start to fall off.

Why is that? Well, that's because of some of the challenges that we've got in the period of the Ohio Replacement, frankly. And again, you all should be intimately familiar with that. The reality is, if you're going to recapitalize your strategic force about once every 30 to 40 years, that's a huge capital investment. If you're going to put that on the back of the shipbuilding program you're going to break the shipbuilding program.

This is part of our impassioned plea with Congress, and frankly with OMB and with OSD. If you put the weight of Ohio Replacement on the back of our shipbuilding program, you're going to break our shipbuilding program. We'll be about a 240 to a 250 ship Navy, and that's just straight mathematics.

So the Sea-based Deterrent Fund, frankly this is Congress listening to our plea and starting to build a framework, give us authorities, give us some tools to build out Ohio Replacement more efficiently. We fought—one of the last decisions in PB '17 was getting OMB to agree to partially fund Ohio Replacement in 2021. They gave us \$2.3 billion in the first year of incremental funding for the lead boat. Our foot is in the door, and our job now is to basically bust the door down the rest of the way.

Today's force structure of 272 ships gets to 308. Again, we'll get there in 2021. If you go ahead and take a break from shipbuilding for just a little while, and you look at the next lane over and take a look at aviation, we have challenges in aviation.

We have aviation readiness issues today. Again, we're flying our aircraft 50 percent above their historical rate, and that's a lot of wear and tear: aging aircraft, track logging depots, backlog in parts and maintenance. And so we have a lot of aircraft out of service reporting against our requirement.

What does that mean? It means more demand in terms of investment in the aviation accounts. At the same time, we've got the challenges in the shipbuilding account. Those two, we have to have a balanced force. We've got to bring both of those into POM '18 and address both of those.

Advanced weapons, I'll call it a gap. The reality is that we've got some tremendous weapons coming down the pipeline. They're in development today. They're going through testing today. But when we start to replace our weapons inventories, we're replacing weapons with advanced weapons that cost about four to five times what the one that's currently in inventory cost.

And this isn't something that you can choose to do or choose not to do. This is something we've got to do because the threat is increasing. The systems that China is fielding; Russia has re-emerged, their capabilities; our legacy weapons; we've got to up their capability. It starts to become a cost equation that's putting a lot more stress on that same budget.

And then the other threat that we need to be wary of is cyber. We're kind of waking up—I saw Dave here. Cyber is starting to get really hard. Dave left the Department of the Navy and took his cyber tools with him, but it's big. It's pervasive. It's ubiquitous. It affects everything that we do. There's not a weapons system out there today that we don't have to take a hard look at, is it cyber hard? Is it cyber secure? We're really at the nascent stage in terms of dealing with cyber, another pressure in terms of investments, pressure in terms of capability, and it will remain a high priority item.

So now I'm going to get to subs. In the 308 ship Navy's 272 we're comfortably at 52 attack submarines, 14 boomers and four SSGNs. I say comfortably—if the CoComs were here they would describe that we meet about 40 to 45 percent of their demand in terms of submarine services. In fact, across the board we meet about 40 to 45 percent of the CoComs demands for ships. You start to think, 272 ships, we have 100 constantly deployed, out of the 272. The way we've been doing that is we've taken deployments that used to be six months and now they're seven months on average. Some go up to eight months. So 40 to 45 percent success

rate in terms of meeting combatant commander demands at 52 submarines.

When you break out that 30 year report, what trend are we on? Well, the good news is that we've been building Virginias at two per year since 2011. Two for four in '12 became two for four in '11. That's good news. We have an unbroken two per year rate that goes from 2011 to 2021, and we'll talk about '21.

So what has happened to the size of the Submarine Force during that period of time? It has gone down. While we're building two per year over a 10 year period, the size of the Submarine Force comes down. It's a matter of replacing the LA class that were built at a higher rate.

If you project on beyond the 2021 timeframe and you take a look at the build rate with Ohio Replacement and Virginia, when they're side-by-side, one Ohio Replacement, one Virginia, we hit a trough of 41 submarines in 2029—41 submarines in 2029. So we're at 52 today, we're hitting 40 to 45 percent of the combatant commanders' demands, China is on the rise, Russia is back in the blue water, and we're going down to 41 submarines. This is the ultimate alarm bell, the ultimate alarm bell.

And, while we talk about attack submarines, the reality is the GNs go away at the same time. They retire in 2026, 2027, 2028. Those four come out of inventory. Their mission, how are we going to make that mission up? Well, we're going to make it up with Virginias. So that's more tasking, more duty for Virginia-class submarines. It's a bad equation. It is a bad equation.

This is the fallout, frankly, of a decade of extremely low build rates for submarines. It takes that long for it to work its way through the system. Now we're not going to turn this around overnight, but what we've got to do is get focused on, what are the opportunities to turn this around?

The world of submarines is going to transition from a stable, inadequate, one submarine per year rate to two per year. 2016 is the first year in which we actually deliver two submarines per year, Illinois and Washington. So this is the first year we actually deliver two submarines per year.

We're just now starting to learn, getting lessons learned on installing Virginia payload tubes. So we're at a jog. We're at a slow jog right now. But in the course of the next four to five years, we're going to go to sustain two boats per year. We're going to add Virginia Payload Modules. We're going to complete the Ohio Replacement design and start building Ohio Replacements.

In 2021 we'll have Ohio Replacement lead boat. We'll have a significant backlog of Virginias coming through the system. And we'll be breaking our teeth and cutting our teeth on Virginia Payload Modules and trying to insert those in-stride in the Virginia program without losing all of the efficiency that's been gained throughout the program. And if we do all this perfectly, then we'll be at 41 in '29, 41 attack boats in '29.

It won't be good enough to do all this perfectly, we've got to do more. And doing more is holding onto two boats per year. It's holding onto two boats per year. How are we going to do that?

First, we're going to take advantage of everything that we've invested to date on all things submarines over the last 10 to 15 years, whether it's the upgrade at the shipyards, whether it's integrated data environments, whether it's learning through a skilled workforce, whether it's expansion at Quonset Point, whether it's the ongoing expansion that's going on at Newport News. We're going to leverage every dollar that we've invested in submarines over the last 10 to 15 years. We've got to hold onto the skilled workforce, but equally or more important, we've got to grow a skilled workforce. We've got to add skilled mechanics at both, frankly, Newport News and Electric Boat, to address the increased build rate.

We've got to get more affordable, because it's not going to be a simple matter of adding another \$3 billion per year on top of the budget to sustain two Virginias per years. So we've got to take a look at all the procurement dollars that are going into submarines in the 2020s and understand, how do we buy down some of the costs associated with increasing Virginia build rates back up to two per year? So we can start negotiating now, Jeff, okay? Or we can wait until Matt is in the room and we can lock the door until we arrive at a common view.

But the reality is that we're looking at over \$10 billion per year for a decade going to submarines, submarine construction. To get that marginal extra boat, it can't cost another \$3-\$3.5 billion for that marginal boat. That's the challenge.

That's the problem. That's the opportunity for everybody here, pulling in the same direction. You're going to be somewhere between asked and demanded to help solve that problem, because we can't afford to settle for the 41 boat attack Submarine Force at a period of time when the threat will be overshadowing what it looks like today.

So, where do we go with that? Where's Dave Johnson? Dave lives, eats, breathes, dies to pull together the program, the single program. The single program is all things submarines. That includes a steady state rate for Virginia at two per year, flowing right through 2021.

The key in '21 is going to be to do that without batting an eye, because we can't afford to put Ohio Replacement at risk. The assumption in the Ohio Replacement Program is lead boat in 2021 and she will deliver in 2029 and she will be on patrol in 2031. She has a patrol date right now that's on a fleet schedule somewhere, and she's going to fulfill that schedule.

That means that everything to the left of that date we have got to hit perfectly, perfectly. That means that if we set a target that says she will be 83 percent design complete when we start construction, that we will be at 83 percent design complete when she starts construction. That means every material item that has an in-yard need date will be showing up in-yard on that date or earlier, and on and on and on.

So now, how do we get there? Two thousand fifteen was a very busy year. Ohio Replacement design, keeping it on stride, we had to frankly work very closely with the Brits to keep common missile compartment on stride. We had an RFP that needed to go out the door for detailed design and construction of the lead boat. To do that we had to lock down the technical baseline. We had a fleet development of specifications. That all got done in 2015. A lot of heavy lifting by government and industry.

The thing we didn't have, though, the thing we didn't have is a clear view on how are we going to build the Ohio Replacement across the industrial base? And how are we going to do that side-by-side with Virginia? So we spent a lot of time last year working with EB and Newport News on something we refer to as the submarine unified build strategy.

It took a look at risks. It took a look at facilities, throughput, manpower. It took a look at investments. It looked at Virginia. It looked at Ohio Replacement. It looked at material procurement across the submarine programs.

We asked for industry's input. We put together an independent team led by Paul Schneider, a lot of you all know Paul, and had them separately take a look at not just industry's input but come up with a separate recommendation, and we formed a government position.

We then brought industry into the room and within a couple of weeks I think we had a deal. I think we had an agreement in terms of how we will build Virginias, how we will build the Ohio Replacement, how we will build Virginia Payload Modules, and how we do this managing risk and costs, industry's concerns and the government's needs. And then we took it to the Hill. We explained to the Hill what our plan is, got concurrence across the Hill, and now we're moving out and executing accordingly.

What comes out of all that, frankly, is the opportunities. What comes out of all that with a clear discussion with industry is a clear view of capacity. And when you go into that level of detail you start to identify the added capacity, now you see the room to sustain two Virginias per year, with acceptable risk.

So I think by every measure, technical, production, financial and everything else. The challenges are pretty incredible. A lesser group of people would be intimidated by it, but you all, not you all. You thirst and you hunger for this opportunity. The reality is we need to get this work done. We've got to get it done in a tough fiscal environment and a million details need to be managed.

I'm going to close with some quotes and then turn the rest of the time over for discussion. Who would Stackley want to quote to this audience? I decided to go with Rickover. I told Dave Johnson

a friend of mine brought a 1975 Saturday Evening Post magazine with an article from Rickover in it. I'm making a copy of it and giving it to the CNO. It still applies today. Everything he said then still applies today, except for references to Jimmy Carter.

But the hard work, to march through the budget, march through what it's going to take to design and build each ship, what it all is going to boil down to is talent. It's going to boil down to people, and Rickover had his eye on that. And so I'm going to go ahead and borrow some of his quotes.

"I have learned from many years of bitter experience that we cannot depend on industry to develop, maintain and have available a technical organization capable of handling the design of complex ships and their equipment unless the Navy itself has a strong technical organization to oversee the work in detail." I'll go to my grave with that belief. My best example of that is a gentleman by the name of Jack Evans.

A couple of years ago we needed to take a look at where Ohio Replacement was, where it was in terms of designs, milestones and all that sort of thing. It was at a critical stage and we needed the best. We needed the best on the government's side to uphold the government's responsibility in terms of pulling the program forward. The reality was the best had his papers in to retire. Jack was working for AT&L at the time. He was on his way out the door to retire.

I asked him if he would consider staying on to get Ohio Replacement through her next milestone. He's a great American. He put his papers aside and he went in and just did one final round of heavy lifting. Frankly, it wasn't just the time that he was there, it was the baseline that he set for the program and the standard that he set for the program. That somebody like Jack, after 35 plus years in terms of working submarines, stuck around for that last go-around on Ohio Replacement to ensure that it was fair in the channel and headed in the right direction. That's what Rickover was talking about.

And so then what do you do when Jack retires? Well, this is where I explain to Dave Goggins, everything that you did in Virginia that you thought was a great accomplishment, that was

nothing but a warm-up. That was nothing but a warm-up because what that was for was to train you to step into the Ohio Replacement Program.

And by the way, this will not be a revolving door. You're not going to go in for a year and then move on. Dave, you're there and just plan on dying with your boots on.

And that's what it takes. That's what it takes, that kind of talent. And I'll be honest, I'm a little bit concerned because I don't know how deep that bench is, I don't. It's probably not as deep as we want it to be, which brings me to the next Rickover quote.

"The most important job of the man in charge of a technical organization is to select and train the people working for him, not to issue orders and directives. But to do so, he himself must be technically competent. No one, no matter how high his position, can accomplish a technical aim by simply ordering it. Nature knows no rank."

So, I turned to Dave Johnson, who was putting his papers in. I looked at this huge thing called "All Things Submarine Coming Our Way." I asked Dave, are you ready for another round? He's a great American. I won't say that after we leave here, okay?

But he is, he is. Personal sacrifice, other opportunities, put them aside. And he knows what's before him. He'll be in the job for three years, at least. In that three years' time he's going to ensure that we've got a clear path for two Virginias per year. That's fine from a programmatic standpoint.

The other thing that he's got to do, and the same conversation I had with Mike Jabaley, was build the bench. Build the team. I don't know how deep, how wide. You guys have to go out there and find the team, on the government side, find the team that's going to carry this on in the years ahead.

That brings me to the next Rickover quote. "There is no broad and easy highway to leadership, but only the long road of experience gained through hard and unremitting work." For a lot of you all, that's been your life. But for right now, I'm just focused on the government side.

When I read that quote, I think about folks like Karen Henderson and George Drakeley and Mike Kessler and Steve Schultze. If

they put their papers in, I'm going to bar that door. Those folks have talent that does take 30 years to get; 30 years of experience and there's no shortcut. Thank God that they are where they are, because what they're working on is so important to all of us.

Which brings me to the last Rickover quote. "Too many naval officers today believe that technical training is not essential and that they can rely on management techniques to make decisions. This has been an important factor in the loss of technical competence in ship design and construction. It is a fact that nearly all decisions in the Navy today deals with engineering problems. So to avoid being surprised by technical advances, we must know where the responsibility lies for the quality of our ships and the readiness of our Navy for war."

Now I'm thinking about Willy Hilarides, who will retire in a couple of months, and SEA-05, a critical billet for all things submarines that needs to be replaced. Those are the next two key positions that will affect all of us, all of our lives, because they will be the individuals that will be responsible for the technical issues that we're challenged with, helping resolve, helping to stay ahead of the problem so it does not slow us down to delivering Ohio Replacement in 2028.

That's Rickover talking about government, talking about the military. I worry about that, but I also worry about industry. I worry about the industry side of the equation.

So again, I look about this room and I see tremendous talent, tremendous experience. I know that with this talent here we can solve all of these issues. But I don't know how deep your bench is. I don't know how broad your talent base is.

But I know this, we can't take anything for granted. We can't take anything for granted. We put 12 men on the field if we have to, we've got to win this game. And I've got to lean on you all to ensure—you know, don't operate inside your PRD. We've got to be thinking the long game here, 10, 15 years.

You've got to be checking your roster. You'd better be checking who is going to relieve your chief engineer and who's going to be lined up behind that individual when he or she retires in the

next five to 10 years. Check your roster. This is not a short game. This is a long game.

We play a 30 year game because that's how long it takes to build a Navy, 30 years. I need you all to be checking your roster. And I guarantee you, when we sit down I'll be asking you, who's on your scorecard? Who's in the game today and who's on the bench, because we're going to be relying on all of you.

So that's a quick broad brush of the Navy, all things submarines. I go back to my opening quote from Pythagoras, know the right moment. Know the right moment. This is the right moment. And if we don't make the most of this moment, if we don't have two boats in '21 in 2018, we probably aren't going to have two boats in 2024 or '26 or the years after. We've got to lock it in and we've got to leverage all this investment, all this talent, all this capability, because the nation needs more than 41 in '29.

So with that, any questions, anything you all might want to talk about? We've got March Madness going on. We've got spring training going on. We've got hearings going on. I've got a gavel up here.

Question. : Secretary Stackley, I think you just became the longest serving assistant secretary of the Navy in the history of our Navy, which I think is a testament to what you just talked about as far as longevity.

SEC. STACKLEY: I think it reflects I can't find another job.

Question. : I was actually going to say, how much longer will you be with us?

SEC. STACKLEY: I don't know. I say this from the heart, I have the best job in the Pentagon. I've got the best job in the Pentagon. I mean, ships, aircraft, missiles, satellites, whatever it is, ground vehicles. I was crawling through an amphibious combat vehicle just yesterday, down the shipyard last Friday. I've got the best job at the Pentagon and I work with a great team.

So I get up every day and look forward to going to work. I go home at night wishing there were more hours in the day. I don't know how long it will last, but I appreciate it every day.

That's not the kind of question I get at a hearing, though.

Question. : Secretary Stackley, just a question about the realm of possibilities. Some of our people have talked about contract execution being one of the long poles in the tent of getting things happening. And I wondered, based on our experience in submarines when we were shorthanded we went to Congress and said this is a critical thing, we need to pay extra money, we need additional people. Any thoughts about contract specialists that we train at NAVSEA and then they go off to the rest of the government for opportunities and promotions? We might say, this group is critical.

SEC. STACKLEY: You know, we batted that around. Here's the reality. This goes back to 2009. The workforce is too small, at the time it was Paul Sullivan, and we said let's map out what sized workforce we need. We launched NRAC to take a look at this. We said, we need about 5,000 more folks in the acquisition workforce to get the job done.

I think contracts was probably number three on the list in terms of numbers. And so we did, we brought in the numbers in terms of contracts. But the attrition rate is high. It is high, for a couple of reasons.

One is, it is hard work. Two, a lot of folks think they want to be a contracts officer until they get to be a contracts officer and then they decide maybe that's not what they really wanted. But three, just like you described, particularly at NAVSEA, the experience that they get at NAVSEA makes them extremely marketable anywhere else in the government as well as outside of the government. And so retaining the talent at NAVSEA has been a bit of a challenge.

We have not arrived at the right answer. Your comment about added compensation or something to that effect, a retention, I'll take it onboard. I know we've talked about it.

I actually had three all day off-sites this past year with all the heads of contracting just to talk about the workforce and the work, because they're out of balance right now. So we're kind of on a campaign there. So I'll take onboard the notion of, what more can we be doing to retain the workforce? That is our most inherently government responsible thing, okay, the contract. They're our frontline soldiers.

With the headquarters cuts coming and people start to sit there and try to suggest that we're going to cut contracts, it's like, over my dead body. This is our life blood. So ask me again in a couple of months, okay?

I don't want to stand in the way of the awards ceremony, but thanks for your time. Thanks for what you have done in the past. More importantly, thanks for what you are about to do.

**NAVAL SUBMARINE LEAGUE
2016 CORPORATE MEMBER RECOGNITION DAYS**

**VICE ADMIRAL JOSEPH MULLOY, USN
DEPUTY CHIEF OF NAVAL OPERATIONS FOR
INTEGRATION OF CAPABILITIES AND RESOURCES**

**BREAKFAST SPEAKER
March 10, 2016**

Thank you, Admiral Donald. He's been a long-time friend and mentor. I first met Admiral Donald when he was PERS 42B and I was working for Admiral Joe Lopez in the N8 front office as the Deputy Executive Assistant. Then he got orders to DEVRON 12 and I got orders to the USS SAN JUAN, so it worked out pretty well and he got to lead me again.

At that point in time he would go skiing and the rest of us Commanding Officers were told you can't get hurt—so we couldn't go skiing. So we had wonderful skiing in New England, but were not be able to go enjoy it. I learned a number of things working for you, sir. I guess one of them is: life isn't fair sometimes, and then you get assigned to be N8.

Next slide, please. I spoke to the Submarine Industrial Base Council last week and it was an interesting group, hundreds of people from a lot of the companies that support the major companies here. I really enjoyed that evening. It was more of a talk about what submarining is and the importance of quality assurance. The same applies here to all of you, but I think you all know that message.





I cannot fully explain to you the value of the Submarine Force as seen right now in the Pentagon to our Combatant Commanders around the world. I see it in the blue pouch from what used to be N23 or N-009G with a bunch of manifestations of what's going on and what the aviators call sneaky stuff. It's an array of amazing commanding officers and people out there riding on fantastic submarines doing important things day-in and day-out get our attention and gets seen by the president and the leadership.

I was telling Admiral Donald about a fascinating conversation with my compatriot in the Air Force, the A-8, over the holidays. General Breedlove, who's an Air Force four-star, the Commander of European Command, was discussing a number of issues as the Air Force budget was locking. And one of the things he was talking about which concerns him on a daily basis is what's going on in the submarine world, the Russian submarines, and what is he going to have available in U.S. submarines and anti-submarine warfare capabilities? That's one of his major concerns. He's

looking at Europe falling apart, but the man is talking to the N8 about the Submarine Force.

I'm kind of jumping back: we need to remember—on the Naval Academy football team, tradition never graduates. I would say excellence can never be allowed to graduate in what we do. We have been through ups and downs in the Submarine Force, and we're heading towards a period of going to 41 submarines. But what we are doing is important and we have to keep buying the submarines. And that has been the message on the Hill.

My message is we have to keep buying surface ships too because we will get a backlog twice as long and almost as deep on DDGs and cruisers if we're not careful in the future. So that's what I have to balance as I look at this whole picture. We have to keep building quality in there as well, and it's across the whole shipbuilding industry and it leverages all of America's talents, led by a lot of the men and women in this room.

It's a message that shipbuilding is important. The SECNAV has been talking about it. We have to be able to keep what we have and maintain the efforts to allow our ships to go to longer life, but at the same time we have to also build new to get quality, to be able to take on the world as it's changing.

So where is our '17 budget? It is a balance, and it was a difficult balance. I will tell you a year ago as we were working on POM - 17, there were a lot of big bills coming in. We weren't going to be able to buy all the things we wanted to buy. How we were going to square the circle I didn't know.

When this POM went down to OSD, I will tell you a lot of stuff that got bought at the end wasn't there. We had to make a lot of hard trades. We had to put the money into ship maintenance. We had to pay for the new construction aircraft carriers. We had to pay the total bills of what was going on.

So we ended up cutting a lot of capabilities we need to have, but we had to square our circle. Our take to OSD was; if you want the Navy, we want to be that Navy, but a Navy of this size costs this much money. They were like, we're going orange and red in all these plans.

I'll talk at the very end about all the plusses that came back. As they went through the Strategic Portfolio Reviews, the value of the Submarine Force and the initiatives—even innovations working with SCO, the Strategic Capabilities Office—we leverage them, they leverage us, the Navy, but they also leverage the Submarine Force. So that connection to SCO, the innovation thoughts, what submarines could do, was really, really important, and it showed up in a number of areas with the UAV and submarine development and VPM and acoustic superiority.

Most special was Ohio Replacement. In the end we did get money from OMB, \$2.3 billion in '21, to actually be able to fund the first increment 41 percent. So that was a significant add to the Navy at the end.

The U.S. economy has been slowly improving. But it could be a challenge for us that one change in the 10 year Treasury bond rating could affect inflation rates, which could affect the debt we have to pay each year, which competes for the dollars I worry about. And I'll talk about the balance later. That's my concern of what's going on.

But because we are on this line of where things were actually improving for a while, there was a tremendous amount of—effectively it was called inflation savings. The cost of doing things was less. That money rolled back out again and that's where the \$21 billion came that DOD had that the President didn't have to add back in and actually squared that circle that allowed us to pay for a lot of these items. Otherwise, they wouldn't be here.

So basically from June through November there was a massive discussion about the value of DoD. Everyone kept coming back saying the Navy is important, but how are we going to pay for it? We had some ideas and they had some, and that made it helpful. But in the end we have a Navy that will be able to maintain maritime security in our dynamic environment.

We shrank the naval power with a number of interesting investments. We have to make hard choices, some we'll talk about, and we have emphasized innovation and reform.



This is the way that John Richardson kind of looks at the world, and I actually relish the discussion, as opposed to a flat view. This is a chart I could have had in the 1700s, and the yellow lines would have all been sea lines of communication. If you look at the individual areas, the Mediterranean could have been Phoenician or Roman sailing routes.

When I was over in Mumbai, India, on the Pacific Fleet staff, the connections between India and the Persian Gulf were tremendous 2,000 years ago. Independent of all of the sailing going on, those connections you see over there were all alive and well. There's very large numbers of items in the Indian museums that go back to connections with the Babylonian Empire.

But that also reflects the modern world and why we have to have a Navy. You look at what we call the five—not really adversaries—but the five conditions of Russia, ISIL, China, Iran, and North Korea, they're laid above us there. How do you engage that as a Joint Force? You can clearly see that if you want to



defend America and be pushing ahead, this view gives you—that Navy and Marine Corps team.

It also tells you the cyber connections are alive and real. We need to have a Navy pushing out to defend and we have to be well-prepared on cyber. There are inroads connected into us right now. We've seen that with the OPM hack and other places. We have to make sure we don't have ships taken over or shut down.

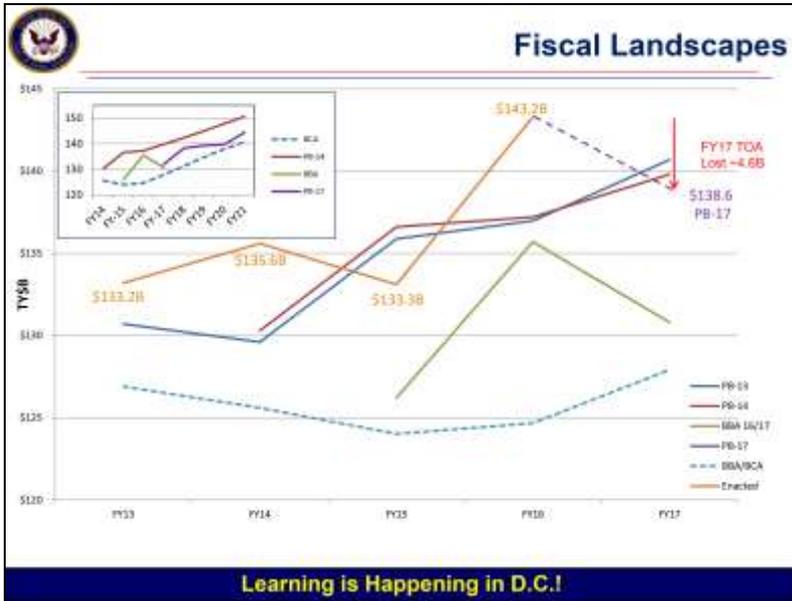
So, as we look at that more, we are connected to this web. This is the world we live in and we need to have a modern naval force to be able to push out there and be able to make sure these conditions are all well away from us. And you can clearly see where Russia plays center point in General Breedlove's, and our, view.

In the Pacific it's the China connection. It's a little bit harder to see it here, but the focus is, what's happening with their trying to segment those areas? The aggressiveness and the level of building in the South China Sea has now expanded to Scarborough Reef, another area that can be built up over there. And as Admiral Harris, who I'll see next week, will talk more about it, the "Great Wall of Sand" is kind of resonating on the Hill.

Both Admiral Harris and General Breedlove last week mentioned they are getting about 55 to 60 percent of the submarines they want. And I heard about, when I was testifying the next day, about "what are we doing?" "What about ship construction?" "What do we have to have?" "We don't have the forces we need." We need to have a national discussion on that.

I just saw an article yesterday that said the Marines are the right size, we should cut a Navy carrier, we should cut some other stuff. So I'm not sure of the value of this poll that was done and who was polled, but it's clear that the American people don't quite see the world this way. And that's one of the important discussions which has to happen on a nationwide level. What does it mean to be in the modern world?

We see it inside the Pentagon, as I look at defense scenarios, it's not quite clear to everyone else around the country. I think that's going to be an important part of the message. Hopefully it comes out in this national debate in the election.



It wouldn't be a Mulloy meeting if there wasn't a graph. Less to say about individual years, but I will tell you the orange line, up and down, the real spikey one, that's the actual money I've gotten enacted. If you're running a business, that's not exactly the kind of money profile you'd like to have to be connected over time. The spiking going on is a relationship of what D.C. would call—quote, “learning to live with the monster they created, the Budget Control Act.”

I talked before about how I've gotten about 84 to 93 percent of all the dollars I've wanted each year. I lost \$25 billion in the first four years. I'm actually about even in FY-16. A billion dollars was added for a DDG (two-thirds of a DDG, so I'm actually down in '16, but not that much).

In FY-17 I'm down another \$4.6 billion. That's the big red arrow there. It is difficult to plan in that world, but we're trying to do the best we can. Congress has been working with us but, unfortunately, it's not the real solution we want.

It has been an exhausting time. I know it's exhausting for all of you. It has been exhausting for me since this sequester thing started.

On Christmas Day of 2012 I was up in Maine with my family visiting my in-laws. On that morning I got up and got a call. We opened Christmas gifts at nine o'clock, got on an airplane, and came back down to D.C. to start working, on Christmas Day, and didn't take a day off again for three months until we actually got some kind of a year-long CR. We eventually got an appropriations act, but we were down \$13 billion.

Everyone in this room has been living that dream. It is better now than it was then because, essentially, what they've discovered is they can write a Budget Control Act, try to pass some of the bills in different years, give us some of the money, and put a lot in OCO. And I will tell you—you've heard the word OCO gimmick? It is not a gimmick. It is a matter of learning.

It is a matter of when the money is appropriated it merges with the account. Congress doesn't consider it a gimmick. OMB only considers it a gimmick. OSD considers it a gimmick until they get the first dollar and then all of a sudden it's not a bad solution.

We squared our circle this year with a lot more OCO. If there was not OCO Congress would have enacted an OCO solution, or they would have lifted this Budget Control Act, because you cannot run the country at the BCA levels in any department across any part of the federal government. The President is holding out for—he realizes all of your non-DOD entities would be falling apart as well, so that's why they get some of the dollars. We get some base and then DOD gets OCO on top of it, as well as a certain amount of Treasury, all the people that get NIP dollars and other counterterrorism dollars.

So it's an interesting process. I expect it will keep going. My issue there is, in the slide what is that green arc, that green arc in the middle? That's the FY-15 BBA and for FY-16 and FY-17.

I was talking to the Staff Directors for the last two days about a bunch of items on the Hill. What will I get in '18, '19, '20 and '21? There will be two more BBAs. This law doesn't lift until '21, and I can see no way in this national discussion in this election

right now that anyone is going to lift that. All we can do is wait out this storm.

We talked about it. I mentioned it here in this room a couple of years ago—I'm in the middle of falling down 10 stairs, one stair at a time, breaking bones as I go. I'm now five down and five more to go and it's not as bad as we thought. We're getting fixes as we get along, people stitching steel bars in my arm and giving me OCO dollars, and I fall down the next stair. There are still four more to go.

So eventually, I don't think I will be able to live long enough to be here in this job, but someone will relieve me and finish the stair falling. In '22, hopefully there will be some recognition that we need to move on. The issue then will be, what will be the amount of national debt.

I don't think the BCA law will end. I think we'll just cope, and I don't know how much money we'll get. Each year has been more than the past, because Congress is learning about what they have to do. I think that's an important message to people here, what is required for the Department of Defense and what solutions are there? I just don't see that one changing.



Critical Capabilities PB17 and beyond

- Innovations**
- > People**
 - Sailor 2025
 - RRL
- > Aviation**
 - F-35C
 - E/A-18E/F
 - F-35C
 - STINGRAY [MQ-XX]
- > Surface**
 - DDG-51 FLT III
 - ESB
 - TAO (X)
 - LHA(R)
- > Cyber Resilience**
 - CANES / SHARKCAGE
 - Cyber Teams
 - F30F-Mcode
- > Electronic Warfare**
 - SEWIP Bk II / III
 - SSEE INC E/TCS
 - Next Gen Jammers

Critical capabilities we brought, our *Sailor 2025*,—it’s important—we’re investing in the health and welfare and the fitness of our people. We are doing Ready Relevant Learning. I think Fritz may talk more about—or actually he was in his previous job, I’m sorry he’s now SUBPAC, so he leaves all that behind now. He turned that over.

We created, as many of you know, a long system of very advanced C-schools. A petty officer in the advanced electronic field comes in the Navy and he won’t be on a submarine for two or three years. We’re going to kind of cut that back. We’re working with all the Type Commanders to start changing the rates that people get to sea, to change the schooling. There’ll be computers in it, but it won’t be just straight, solely computer based. They’ll be actually more focused, with more vigilant tutors and some learning, to make people relevant and ready.

I think this will work. I don’t know if it’s quite the panacea that they say, but my son’s in explosive ordnance school right now

and that's one place where they tested it. He said those things are helping, especially on the enlisted side.

I think that's the parallel level up there, how do we get more of our people? We see it—in terms of savings it's about 6,000 people. We're not going to put anyone out of the Navy—it's just the people waiting for education, the people in education, there will be fewer of them sitting and waiting for long schools, and that's where that savings came from.

In aviation, we have cut it. We have cut that, except this year. The money available here, there are 13 more JSFs. Congress has been able to buy a lot more F-18s. We have a Strike Fighter shortfall. We could not put money in '17 because of the shortfall with the BBA but in '18 we added airplanes in.

What's that expectation? Two things, one we think a Middle East partner is actually probably going to buy F-18s; and two, I'm pretty confident that Congress will buy more too for us. They have the last couple of years. I expect they'll fill in that divot. And between '15, '16, '17 and '18, we'll have between 36 and 40 F-18s more, which will be very helpful. Congress added seven more Growlers, so we're at a fleet of 160 of them. We will be able to man our carrier flight decks with eight, which is much closer to what we want to have for that modern electronic warfare world, especially dealing with the two major foes that we are concerned about, especially China.

We are going to build an unmanned vehicle called Stingray. This has been a two-year-long painful process. The Navy was ripped apart—half of DOD said we had to have a penetrating high stealth, compete with unusual agencies for having a vehicle to fly from a carrier.

We were like, okay, but we want something lower-end. We really want to make the air wing better. We want to be able to mission tank and have some ISR off this thing.

You couldn't square that circle. I mean it was impossible to come up with the money that would have a program that would have something from an aircraft carrier fly downtown over major countries, at least in any kind of numbers, and be part of an air wing. So, we ended up saying okay, the higher end portion we'll

wait. It will be a part of our next generation air dominance. There's other services or other agencies doing that. We need to focus on the lower end and take what we've done as demonstrators, as UCAS-D and other stuff we've done, and actually go on.

And it relates to—what happened to UAVs too is you have to eventually move on and build something that will work for us, and that's where we're going on that program. We're pretty excited about it. We actually have a gate review with Mr. Stackley and the CNO and myself on either 4 of 5 April. We will finalize those requirements for the MQXX and actually go back out to the four partners and get going on an RFP as fast as we can to build something that will have some ISR capability, probably 15-20,000 pounds of gas, and have some legs on it to fly 14 hours to be able to match the duty cycle on the aircraft carrier but still also support strike fighters and make a difference when we're out there on these long missions.

Surface ships across the board, DDG flight threes, we have to have it: 30 times more sensitive radar. The ESBs, Congress brought one. I mean, this is our third base. The first one has been operating here—it's going to be going to the Middle East here within about a year. It's pretty amazing when you have a giant tanker that's got a larger than a football field flight deck on it, and you can put V-22s, 53s on it. The Special Forces are excited and so are the Marines.

And the Marines took a long time checking us out, thinking about what are we doing? Are we walking away from them? It's interesting, I have a great relation with the Marines, but my father told me a long time ago, "Joe, Black Jack Fletcher and Guadalcanal, the Marines will never forget."

No kidding, he's absolutely right. He told me that back when I was 17 years old and going to the Naval Academy. He said, "You'll have an interesting relationship with the Marine Corps." I love them but it's always painful.

Here we are, exactly. I have an interesting relationship with the Marine Corps and it's always painful. But they were concerned that we were going to walk away from amphibs, and we're not, but

we have to have a different way of doing business as we go forward.

This idea of flexible basing, other ways to make things happen— and it's not always going to be totally opposed to transits shore, but we're building to 38 amphibis. In this 30 year plan, actually shortly after 2020, we get to 38. But these ships will make, I think, a different level of being able to maneuver in the world and deal with the world we really have, especially in the ISIL counterterrorism world, which is going to be the most prevalent thing people will see.

The China/Russia fight plays out in the backdrop. A lot of it is classified. It's hard for people to see. This fight is actually in the obvious places where we have to be and have to have those forces.

TAO-X and LHA-R, we've got the bids in. It's a pretty exciting idea for competition for NASCO and HII to compete for who wins what ship there and then who has most of the R&D for the LXR, the replacement for the LSDs. So shipbuilding, we just have to protect the numbers. The program is going well, but once again the concern is the numbers and the money.

Cyber and electronic warfare—cyber has been important. We're still supporting that. That's one area where we added some dollars over time.

The bottom line is, once again, where did later money roll back in? It rolled back in to buying—and I'll talk about submarine stuff—it rolled back in to buy those airplanes. It rolled back in to buy a lot here.

We are buying many more SEWIP with Block IIs and IIIs. We need to have that to be able to electronically defend our ships. The old SLQ-32 has been around since I was a Midshipman. It's getting a little long in the tooth and it really can't even detect the things Russia or China are doing. We have to go onto this next program. We were able to buy 18 more for a total of 40 something over the FYDP to outfit our ships properly.

The same with the signal exploitation sets, which is essentially, for the people here, a surface ship version of having your cryptology gear onboard. We were able to buy that. We also brought 41 more of what they call Tactical Cryptology Sets. It's a

three rack system to put a lot more of that on ships all the time so that every one of our ships will be able to have that embedded facility and be able to have a simple three rack stand that could be added to in time of need.

Normally, surface ships only have limited SSEE equipment and sometimes only part of the time. They're realizing that's part of the world they have to have to deal with, UAVs, and deal with the Iranian Guardsmen, communications, and understand what's going on. You have to be able to sense the environment around you.

Communications and electronics, we need to put that everywhere. Buying 41 of the TCS sets gets a lot more surface ships plugged into that cryptology world, which is where we need to be. If you take that and you link them together, you start putting the power of American computing together.

I feed dollars into programs that NRO is working on that can tie a snippet of data, a comms hit here, a detection of a UAV there. What did I see on a satellite? Did a submarine get underway? You start stitching this together, the power of where we go, that's where I see some of the Third Offset stuff is—how do you link naval programs around the world with national sensors and then find out what's really out there?

So even though it's a simple purchase, it makes a big difference to making a network. I think Chas Richard would tell you, every node on a net can add value, especially if they have some kind of communication path and if they have equipment that brings value. So putting TCS out there gave me 41 more nodes on that net that are now receiving the things that China, Russia, Iran and North Korea are doing.

The Next Gen Jammer, the NGJ, is another key step ahead. I mean, the ALQ-99 has been around forever. In fact, today they're having meetings going on out there at El Segundo as we work our way through the next phase on contracting for NGJ. Other capabilities: weapons. SECDEF just announced we sank a ship with a SM-6. It is an anti-ship version now, so it's an anti-air weapon that now has multiple capabilities. The ability to have

prompt strike at high speed at great distance is a capability we have to have, and that's what that weapon brings us.

We're doing that with a number of other weapons. LRASM is launching from airplanes right now, but eventually will become OASUW Phase 2: same idea, high speed, deliver at great range. High Velocity Projectile, how do I make not just rail guns, but use all 106 barrels on the surface fleet to fly a shell at more than 30 miles and have the accuracy to knock down a cruise missile? You change the scale in our favor when I finally shift the old paradigm that at some point in time the thing I blow up will actually cost more than the thing I use to blow it up with. Then I can have a \$10,000 shell take out a multi-million dollar missile, as opposed to a \$5 million dollar missile shooting down a million dollar missile.

Maritime TACTOM, we've demonstrated that we can steer a TACTOM into a moving target. We actually have funded this item to actually modify the Tomahawks when they come off the improvement line at Raytheon at the end of the FYDP. We'll have about 245 of them by FY-21.

They'll actually be able to go back to kind of where we had the TASM a long, long time ago. I remember going through the department head school and all the various paths and searching. This will be a different level. Where that thing would clobber every other white ship in the world, this thing will be targeted better.

Once again, the communication paths, the picture of the world, comes from our communications, our national architecture, but we have to have a weapon that can actually strike on the move. These are just different paths to make Russia and China think about where are we going, what weapons do we have, and helps us on that bottom line *hole analysis*. You only have so many holes on a ship, can you get more of the weapons you have in there? A hard choice.

Depot maintenance, we had to add a lot of money to that. We have to keep what we have functioning. I want to build new.

You're all going to see about a two to three percent cut in OPN and RDT&E lines due to the BBA cut in FY-17. We protected Ohio Replacement, protected some critical items in the



Across the board, I've been able to have a slide on the Submarine Force that has a whole bunch of pictures on it because it's an area that resonated with OSD. It's a very different world at the Pentagon than in 2004 right now, but the value of submarines has not changed—they were just not properly appreciated—sometimes you have the long view. I talked about *tradition never graduates*. The role of the people in this room is to keep saying “this is a relevant force.” It took a while to connect through to OSD and now it's connected across the board. When I have two combatant commanders testifying that one of the biggest thing they need is submarines, it's a very different world than we were in in 2004.

But the people in this room knew, kept their eye on the ball, and what we have to keep doing is to remember there is one ultimate stealth platform. There is one place that you can connect in and sample the environment and actually violate that Heisenberg uncertainty principle. We can measure the speed and charge on an electron at the same time because we're not part of the



experiment. We're outside of it, but we're inside of it, and we bring that value.

As we worked through the Submarine Unified Build Structure (SUBS) with the corporations and Mr. Stackley, we see that there is a ramp out there with the companies, between HII and Electric Boat and all of the hundreds of vendors below them, that the ability to move and maintain two a year, convert to adding a VPM, and also get a Ohio Replacement on, there was some real concern Ohio Replacement cannot slide. I think you heard that all day and probably last night. We have to build ORP in '21 to get to sea in '28 to be on patrol in '31. We're going to build a submarine twice as large as Virginia but build it in the same time, seven years. That's a tremendous feat, tremendous level of effort.

At the same time, we're going to put a 70 to 80 foot plug into Virginia, three of them before ORP, and we're going to keep on building Virginia just as excellently and as fast as we have been. That's a tremendous order. Very few industries in this country could do that. And I've got to admit, this symbiotic relationship between our companies and our Submarine Force is what made a tremendous difference for our country, and will continue to make a difference. We have to do that, but we can't take our eyes off the ball.

The Navy and OSD have taken a hard look at this one and said, you know what? We can ramp through that. We can build one VPM. We can build two VPMs. We can build Ohio Replacement. One of our goals in POM-18 is to go back and start scrubbing accounts and see where we can go and be able to stay at two, because I've got to work with that trough out there, the submarine trough as well as the DDG trough.

ICEX-16 is coming up, pretty exciting times. CNO is going up. SECNAV is going up. Having been up there myself, it is a tremendous effort to learn about the world. We kind of slowed that for a while. We're back again. I think in two years we'll be doing torpedoes.

The U.S. is heading the Arctic Council this year and part of their meeting was in Alaska. Some of those people may be going up to the ice camp. We are a relevant part of the force. We

understand the Arctic. Almost everything we have in Arctic manuals came from the Submarine Force and a lot of people in this room. I think that's another connection we have, bringing excellence to the Navy and to the nation.

Quonset Point, I was up there a couple of weeks ago, a pretty amazing facility. The scale of the machines to fill one room to build an Ohio segment is pretty impressive—it shows the scale of this country to build that kind of precision. And it's interesting, talking to the engineers there. One of the issues we're having on aviation depot maintenance is the F-18A to Ds, the older F-18, when they drove a panel, they were plus or minus an eighth of an inch on a high speed precision aircraft. So that's why they can't rapidly replace parts because you can't just come up and build a part for an A to D. Nothing would work if you built all these parts and put them in. They would never line up.

They're talking plus or minus ten- 20,000th of an inch on a submarine that's 18,000 tons. I mean, the scale of accuracy in what I would think aviation would be, is where the Submarine Force is and where aviation is going. I think Joint Strike Fighter is obviously very different than that, and the E and F is, but I was amazed at the difference of the scale and the accuracy in the construction industry you're in, compared to what I saw in aviation depot, and aviation is going to have to get caught up on that to have that kind of accuracy. I think they are in some of the more advanced areas, but I was just tremendously impressed at Quonset Point.

UUVs, I will tell you significant investments, \$634 million added to the \$1.5 billion program we have. This is now over \$2 billion over the FYDP in the Navy for UUVs. It was an interesting discussion in the Strategic Portfolio Review, OSD was like; we really want the Navy to get going on this one. Where are these investments going to go?

The talk at that meeting was, if you told me in 1993 or 1995 I want a Raptor to be able to take out bad guys and fly for 19 hours and have this amazing ability to ISR and do slow-motion video and do all the things we do to rapidly get to a Raptor, you never would have been able to build a Raptor if I said build it in '95. I

said, UUVs have advanced but we still have a long way to go. We don't have that same level. We don't need to be building one answer right now.

The LDUV Program of Record was to build 19 of them. Okay, well that's really interesting. It will never be what I want. It will never be the right answer. What we really do is get a lot more options out there. So this money buys 21 UUVs, 16 of them are sized for submarines, five are much larger ones, and it actually puts in money to do operations and exercises forward, and actually provides money for fuel cells, power options, communications, everything. Because we don't know what we don't know, but we know we need it.

The Submarine Force, I think, was afraid of UUVs 15 years ago. Some people said it might compete with the submarine. I think we realized we need to embrace it. But we've had a number of fits and starts. Are we going to lose these darn things—and we have—and whatever else?

But the picture here on the left of the NORTH DAKOTA — and I'll tell you, Doug Perry has been an amazing champion across this. He's single-handedly moving the ball. It's amazing for a captain to have that much impact across OSD, the companies, and everywhere else. He has had a tremendous drive to make this happen.

And this mission is exactly where the CNO wants to be. He wants to take them forward. He doesn't want to do an exercise in California. He wants to go to the Mediterranean and he wants to go to the Western Pacific and do a tactical, actual, real operation with these vehicles and have the faith that some of them will come back and we'll get something out of it.

So NORTH DAKOTA is kind of a highlight of that's the way we want to go. That's why the CNO embraced this money. It's paying for operations to put these 21 UAVs in the fleet.

We have one UUV operation going on, the first one of these large ones, is actually on a 500 mile trip. It is from San Diego to San Francisco and back, but we need to do something over there. This may be some of the last ones we do close to CONUS. We need to go forward. That is a tremendous investment.

There was \$600 million put into acoustic superiority to make all the submarines like SOUTH DAKOTA, and actually start putting large arrays on the older Ohios, and actually putting them on all the Virginia-class to make those changes. That's another significant investment.

There's \$500 million for VPM. There's \$571 million for submarine combat systems. This is a tremendous area of investment between OSD and Navy of money because it has tangible, measurable outputs. It shows up in that blue pouch, every week, of what's happening. Our Sailors, our Commanding Officers, have guts and they're working and operating with great systems and great equipment. We are getting bang for our buck and it's showing up across the board as what's happening in the world.

In the middle there, that D5 LE picture (slide on page 42), I think Terry Benedict and Cecil Haney must have conspired with Scott Ridley or James Cameron to pick the right night at the right time to launch a missile. You almost couldn't pay to get some guy, some Brit up there by the Golden Gate bridge taking time-phased photography looking over California of a missile shot like that. But it's pretty amazing. The missile that was seen around the world, or at least over the western half of the United States, was just another shot from proven excellence in our D5 Life Extension Program. A pretty amazing testimony to engineering and a pretty important point of making people know we are out there. So it probably wasn't planned, but I'll tell you it's a pretty amazing shot.

And that's an area where we continue to invest in. We put a lot of money in last year for the Nuclear Deterrence Review. That kept going on here where we've added lots of money for MILCON, for the TSP out at Bangor. There's money invested in the TACAMO, strategic communications, our transmitters; not to the same level as before, but that's because it already was a pretty well-funded program.

We're not backsliding anywhere, we have to get there, and Ohio Replacement is just a very small part of doing this. It is



excellence day-in and day-out. The CNO has been focused on that, too.

It's the TACAMOs, it's the planes, it's the petty officers, it's the equipment. It's a recurring theme up there. We have excellence, we demand excellence, excellence cannot leave this force.

Weapons, there are items laid in there about where we're going to go with longer range torpedoes. I think Joe Tofalo and some of the others may talk about that. And once again, the Virginia-class ultimately has been very, very successful. We need to keep that up and not break that golden goose as we step to our new construction.



As I said, I worry about balancing. My job is the total Navy. But I will tell you what I look at, what's the competition for a buck?

And around there, every day I look at what's happening with the stock market. I look at what's happening with the 10-year Treasury Bill. Every one of those affects the money that we get. It's a constant competition.

So I look at all these things each time, and right now the prognosis was it's not as bad as people feel, and I think that's been helpful to us. But I worry that the gains we got during the BCA world are very ephemeral. They could disappear in a moment. One change in one of these factors will all drive to each other and could affect us.

So we are on what I view as a much better, more sound path than last year, but a lot of it is related to the U.S. economy and the way Congress has looked at us. So what we can do is keep Congress looking at us being excellent at what we do, and then keep striving to realize the message of the Navy is keeping peace out there. The day-to-day events where the Navy presents itself well: helping people, reacting to Chinese threats, showing up in the Great Wall of Sand, the events on CNN, all the stuff you see out there, puts that message out there.

The American people know they have a Navy, they want to have a Navy. They don't always completely understand us, and that's just part of that outreach. And I think some of the items you've done with the Submarine Industrial Base Council, of getting to members that aren't in our major cities to understand what the importance of the Submarine Force is, and the importance of those companies.

A fascinating guy I met last week had been working for 42 years for a company that makes welding rod and welding machines. I just enjoyed talking to him. There's probably nothing more important to the Submarine Force than welding rod and welding machines.

I think of all my time in submarines, but that individual talking about his workforce and how important they are and the connection they have in his small town—because he's not in a state that has a direct connection to submarine construction. It's not in Connecticut. It's not in Virginia. But that's important to us,

where they're at. The connections to the mid-West are really, really important to those companies.



So, I'd like to open it up for questions. This has been an interesting fall. I've done about six or seven cycles of this. Everyone is different. All are unpleasant in a different way.

I feel like I'm caught in that series school thing where you're supposed to escape and evade and they catch you and bring you back and beat you. I just get put in different little hovels, as to where I get beat from, but it's an interesting view. But, I'd like to go ahead and see if anyone has any questions?

MR.: Could you possibly talk about what the '16 program might look like and do oil prices and fuel prices potentially help us?

ADM. MULLOY: Yeah, we have started on the first minor reprogramming right now, more related to the over-the-horizon

missile for the LCS we want to test. There's a couple of small items on it. We're actually looking at right now, based on fuel prices, we could have potentially an asset, and we're talking hundreds of millions of dollars.

So now we're in negotiations with OSD to let the services have that money. They indicated they may keep about half the asset to help pay for the troop extension in Afghanistan. That money is what we really need, and, honestly, the fleets are looking at bills in terms of the current ship maintenance they're paying for and some of the operations, to the tune of a couple hundred million dollars. So any money—you know, you give and you lose.

The money I'm collecting, potentially, from fuel the fleet is already spending it, so I don't think I'm ahead at all. It's kind of like I'm here right now, my wife is heading to Tysons Corner Mall. I feel like it's the same way with the fleet.

We're also trying to lobby that if the other forces can't spend their OCO, and there's one particular force that's usually in green uniforms that has provided an asset to the Navy for the last couple of years, that has been helpful.

The Army gets a lot of money but they can't always spend it all. We're definitely eyeing that for a reprogramming this summer as well. It's not in a vindictive way, it's just a matter of the money is there and I'd much rather get it where I could.

MR.: Good morning, Admiral. Many of us in industry struggle with obligating and executing funds. We share that concern or struggle with our program managers. Yet the contracting process seems to be bogged down. Simple modifications to contracts and new contracts seem to take forever. I imagine that drives you crazy. Do you have any words of wisdom or thoughts on that subject?

ADM. MULLOY: Yeah, it drives me crazy but I don't own that contracting point. I will tell you if Dave Johnson is speaking that's a great question to ask him.

He is now Mr. Stackley's principal military deputy. I've had great relations with all the PMDs and it's actually the best I've had

in seven years working with Dave. I mean, what we talk about is we need to get obligated to show internal to OSD and the Hill, we're moving on. Otherwise we all lose money.

I wish I knew where I could go on that one. I talk to Elliot Branch, I talk to Dave. We'll have to keep looking at that.

I think it comes back to some examples of people and give us what—rather than saying it's a general problem—what I'm really looking for is, I can't just say the fleet sucks at RADCON. I mean, that's pretty easy to say. Okay, what program, what did you survey, what ELT, what prototype did he come from?

You need to give some more specificity. But the feedback is, I can't solve that directly. But I will tell you since I'm not in the acquisition world, if you have your companies give me indirect comments I'll try to take those as examples and nuggets and try to walk those back, to what area on that contract is that hard? We do need to make that better because that's the only way I can show Congress and OSD that we're actually using the money wisely. And if we're trying to write a contract, we want what you're giving us.

MR.: Sir, the Congressional Budget Office and Congressional Research Service kind of sounded the alarm about the effect of the cost of ORP on the shipbuilding program. If you look at the 30 year shipbuilding plan, from your perspective, do you see some separate funding for the strategic forces?

ADM. MULLOY: Well, the first down-payment was from the White House for the first \$2.3 billion. So what we've told them is, over the next couple of years that needs to get up to about \$7 billion. So that's going to have to either come from the White House with topline – and that's where Mr. Work has been talking to them, the past cycles of that has been DOD has been able to have on this 20 to 25 year cycle a greater amount goes to strategic without crushing the nonstrategic forces. So that was the potential goal. It is after the BCA law and that's what we're lobbying for right now for FY-22.

I would tell you, the fund doesn't come with any money. It's an interesting discussion. We've been thanking the authorizers for it, and it's important to have a concept because it's on people's minds. But if the fund merely takes whatever Congress appropriates and puts those dollars in there, it didn't create any more money.

There is talk about transferring money in from other DOD accounts, but they don't gain new life. So if I get a dollar in, it's the last year of a three year dollar. It goes in the summer of the year. I have to spend it within a month or two.

And I will tell you, if the Navy turns on this Hoover vacuum called the Strategic Defense Fund and we start going around with OSD in the summer of the last year of this availability of this money, it will not take long for the behavior for all the other services to change to meet and obligate their money and then de-obligate later or something. They'll know with a click, the Hoover just came on. Here comes the Strategic Defense Fund wandering through their little zoo in August or September, and then immediately within 45 days, writing a contract for all the money we just Hoovered up.

We've got to have a different way for the fund to operate. They add money to it. They allow funds that have already expired, like we do for foreign currency, to be sucked up. In that case, we're not taking from the Army, it's just money that went on contract but then got de-obligated.

Now you get into—what the CBO will bring up is the scoring. How do you score money that should have already been obligated—you know, the Treasury never had to go get that money at the Dutch auction. It's gone. Now you're putting it back in life.

So what CBO and CRS have said is, to save 10%, it's the authorities that come in the fund, being able to buy missile tubes economically ahead of need. So as I start buying missile tubes in '19, I don't want to build up to have to have missile tubes. I've got years in there where I'm not building submarines but I just produce tubes at an efficient rate.

Why not get a running start on Ohio's 3/4/5 and 6, and level load that one? I want to be able to buy HPR compressors for Virginia, Virginia Payload, and Ohio Replacement. Why not have a multi-year deal across these programs?

There's a lot of authorities in that where they said we would get 10 percent savings. I'm not sure we're at 10 percent. We know we'll get savings.

So our answer has been, we want the authorities. We'll work with Congress on whether they come in the fund or as a separate authority bill, but we want those authorities. That's where the money will be. But the fund right now, I don't see it generating any money. And like I said, I think it will end up being a negative behavior within the Department of Defense unless they can pick up expired money, and that's not in the bill right now.

ADM. DONALD: We're going to let you off the hook.

ADM. MULLOY: Alright. Thank you very much, sir. I appreciate it.

ADM. DONALD: Joe, thanks. Thank you very much. I think it goes without saying that we just had the expert speak to us and give us some insights that are valuable for the group, but also for the perspective as we go forward.

Again, what's obvious about it is Joe's grasp and his credibility in this business. What's not so obvious is just how many times that guy has saved our bacon doing things and finding money in places that we don't know where that stuff came from. We just don't ask.

But Joe, thank you very much. It's a delight to see you've done so well in your career and we wish you the very best.

ADM. MULLOY: Thank you.

**2016 NAVAL SUBMARINE LEAGUE
CORPORATE MEMBER DAYS**

**COMMANDER'S INTENT FOR THE
UNITED STATES SUBMARINE FORCE
AND SUPPORTING ORGANIZATIONS**

**VICE ADMIRAL JOE TOFALO, USN
COMMANDER, SUBMARINE FORCES**

10 MARCH 2016

Good morning, team. It's great to be with you all this morning, Admiral Mies, Admiral Mulloy, Admiral Donald fellow submariners and captains of submarine industry. Thank you for inviting me to speak to you today.

Before I get into my prepared remarks which are really about the Commander's Intent, my fundamental message to everybody, given that you just heard the *CFO of the Navy* brief the budget situation, is that to some extent *the dog has caught the car*. The good news is the President's Budget '17 has some great thing in it for the Submarine Force, and that's fantastic. The confidence that people have in the Submarine Force on high, our credibility is at the top, so given that, my message to you is *now we've got to deliver*. I need everyone in the room doing just that.

As I look across the room at friends old and new—I can't think of a better group of people to ensure that we do that. So I thank you for that. I thank you for your service, whether formerly in uniform now or as a captain of corporate industry. I thank you for your service, your leadership, because it's our time. We've got a lot of great challenges and it's our time to move out on them.

Let me transition now to what I had prepared, and it is the Commander's Intent document that Admiral Padgett referred to. I hope everyone has had a chance to read it.



It was definitely a team effort: myself, Admiral Fritz Roegge, Admiral Chas Richard, all three of our names are on it. As Admiral Padgett referred to, you should find confidence in the fact that we are on the right course, and it's essentially the same course. There has been some small rudder to account for changes in set and drift. I'll talk about some of those over the course of my remarks.

My vision was to create this *one stop shop* of where anybody can go, whether you're a Seaman Deuce busting rust in engine-room lower level, to a submarine CO, to someone in Office of the Secretary of Defense, OPNAV staff, on the Hill, press, whatever, the full gamut. I wanted a document that anybody could go to, to really understand what the Force is working on and where we're going. We got a lot of good reviews on it and I think it really does answer the mail. But consequently, there's a lot going on here; at a lot of levels. Fundamentally, it was combining these four things into this one stop shop.

There's this first document called *The Design for Undersea Warfare*. It talked about what the Submarine Force should be working on, the Submarine Force itself, lines of effort. It hadn't been updated since November '12, so it was coming up on four years old. So that had to be updated and that was accomplished.

Admiral Connor and Admiral Sawyer wrote this second document on Guidance to the Force. It was a set of five letters, guidance for what commanders should be attentive to.

Then we had this third thing called The Integrated Undersea Future Investment Strategy Executive Summary. That's a thing that I created when I had Admiral Richard's job. I felt it very, very important to communicate to industry where we want to go, and then it's a win-win for everybody. The American taxpayer wins. Industry wins. The service wins. It's more efficient. You spend your IRAD (Internal Research and Development) in smart spots. Everybody wins by that. And those of you who are DOD cleared contractors are able to read it, it's only about four pages long, but very cogently laying that out. From the Force Commander perspective, we never had anything that pointed to it. The Commander's Intent document now does that, but does not get into it in detail. That's the purpose of the Integrated Undersea Future Investment Strategy (IUFIS) itself. But I thought it was important to point to that IUFIS from the Commander's Intent. So whoever wants to understand what the Force is doing and where the Force is going, you could pick this up and understand. That was my goal.

In addition we had this fourth thing called *The Undersea Dominance Campaign Plan*. You'll hear me refer to it as *Vision 2025*. There are some minor tweaks to Vision 2025. I'll talk about those in a minute. But again, we're on the right course. You should feel very confident in that. These are literally minor course corrections.

But prior to now, Vision 2025 wasn't written down, it was just a PowerPoint presentation. And so we took the time to do that in a cogent manner, and I think there's tremendous value in that. Again, we've gotten very, very good reviews across the board from that.

So, at a high level, that is what we were trying to accomplish, and I think we did that.



Intended Audience

- **Submarine Force and Supporting Organizations**
 - Submarine crews and their leaders (i.e. the "Force")
 - Organizations that build, support and enable the Force
 - Government Civilians, Reserves, Industry, R&D
 - Maintenance, Training, Team Subs, IUSS, Sub Rescue, etc.
- **Not Intended to address**
 - All undersea forces (e.g. MPA, CRUDES, ASW helos, etc.)
 - ...although we certainly work with all of them
- **Primary focus**
 - Submarines and their crews
 - Maintaining Undersea Superiority

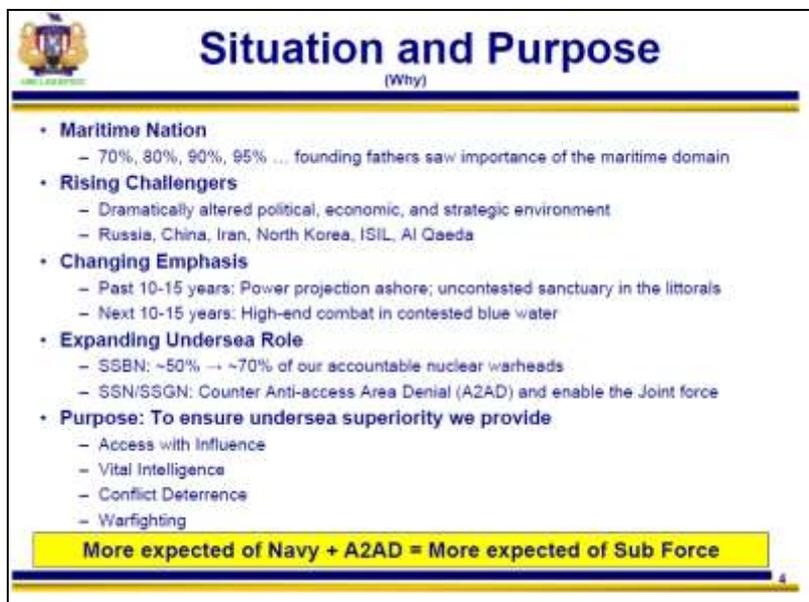
All of us have vital work to do!

So who's the target audience? Clearly submarine leaders, their crews, i.e. the Force, all the organizations that build, support and enable the Force, NAVSEA folks, Team Submarine, corporate, industry, those in the R&D world, the UARCS (University Affiliated Research Centers), government civilians, anybody who has anything to do with advancing the Force, there's a little bit of something for you in here. Granted if you're a submarine skipper you probably care a little bit more about the lines of effort.

If you're a person at a UARC or in industry, you probably care a little bit more about Vision 2025. But it's all in there and anyone who has ever worn dolphins probably cares about the whole thing. So again, I thought that really came together nicely.

Now it's not intended to address all of the undersea force issues. It's not meant to address CRUDES, MPA, etc. But it's really about, in the end, the primary focus being submarines and

their crews and maintaining undersea superiority, that asymmetric advantage that Joe Mulloy talked about in his breakfast remarks.



Situation and Purpose
(Why)

- **Maritime Nation**
 - 70%, 80%, 90%, 95% ... founding fathers saw importance of the maritime domain
- **Rising Challengers**
 - Dramatically altered political, economic, and strategic environment
 - Russia, China, Iran, North Korea, ISIL, Al Qaeda
- **Changing Emphasis**
 - Past 10-15 years: Power projection ashore; uncontested sanctuary in the littorals
 - Next 10-15 years: High-end combat in contested blue water
- **Expanding Undersea Role**
 - SSBN: ~50% → ~70% of our accountable nuclear warheads
 - SSN/SSGN: Counter Anti-access Area Denial (A2AD) and enable the Joint force
- **Purpose: To ensure undersea superiority we provide**
 - Access with Influence
 - Vital Intelligence
 - Conflict Deterrence
 - Warfighting

More expected of Navy + A2AD = More expected of Sub Force

If you're a joint doctrine person, you'll recognize the Commander's Intent layout from situation, purpose, CONOPS, desired end-state, etcetera. We simplified these a little bit so they may not be doctrinally perfect, but I think everybody in this room gets this first bullet, the fact that we are a maritime nation. That's kind of foundational to why we are all pretty much in this room if you really boil it down.

Seventy percent of the planet is covered in water. Eighty percent of the world's population lives within just a couple hundred miles of a coastline. Ninety percent of how anything gets anywhere is by a ship.

We don't FedEx Ford F-150 trucks in a plane around the planet. They get there by ships. iPads, trucks, cars, parts, stuff that you guys make, it's all about those sea lines of communication.

Ninety-five percent of what's in cyberspace is not bouncing off a satellite in space but it is in a cable under the water. That's our domain. We've got to protect that.

Even our founding fathers saw the importance of that. From what's written in the Constitution to *raise and support armies*, but *provide and maintain a navy*. George Washington, the father of our country, an army general, an army guy to the core, personally said "you can't do anything definitive without a navy," but "everything honorable and glorious" with one. Pretty strong words from a pretty hard core army guy.

People understand that. We're a maritime nation. Now add on that how things are changing in the world today. Admiral Mulloy touched on some of this already.

Russia, totally on the resurge, illegally invading Crimea, clearly not afraid to use force in doing so, in violation of the INF Treaty. In fact, if you lay out countries, Russia being one of them, that have a new SSBN in the water and are flight-testing a new submarine-launched ballistic missile, it's: China; Russia; North Korea, granted not a nuclear submarine but an SSB no less; and although not in that same club but from a proliferation standpoint, India. So there's four countries on the planet with a new ballistic missile submarine in the water and are flight-testing a new submarine-launched ballistic missile, and none of them are the United States. That is a different world. That's a changing place.

China, illegally building territory in the South China Sea that wouldn't otherwise exist. In the past two years, China has increased from five acres of land that was above the waterline 23 months ago, to over 3,200. That's over 3,200 acres that they have claimed in that same period. That's a totally different approach for the Pacific and some of Admiral Roegge's challenges. In the next 12 months, sometime in the next year, China will operationally deploy their new SSBN with a submarine-launched ballistic missile. Think about that. For the first time in your lifetime, your family will be held at risk by a submarine-launched ballistic missile from some country other than Russia. And there's no START Treaty with China. Again, it's a different, different world.

North Korea, even as crazy as things are there, recognizes the value of a submarine, trying to build a submarine-launched ballistic missile.

Throughout Russia's tough economic times, they never stopped spending money on what they consider their capital force, their Submarine Force. I'll quote Vice Admiral Johnstone, the maritime commander of NATO who recently said, "It is the level of activity from Russia, from a Submarine Force perspective, that has been significantly higher than it has been in the past."

So the emphasis has changed. If you've read "The Design for Maritime Superiority," signed out by our CNO, you get that loud and clear. The last 10 to 15 years have been primarily characterized by power projection ashore, launching Tomahawks from uncontested littoral waters. It's a totally different ballgame when you wrap in what we just got done talking about.

The next 10 to 15 years are going to be characterized by a high-end fight in contested blue waters. It's a return to the maritime, a return to the high-end fight.

Continuing on, you have to totally appreciate the fact that given all this, there is an expanding undersea role. It's very, very evident. Take the SSBN force alone. Right now we operate a little over 50 percent of our nation's strategic assets from the U.S. Submarine Force. So the other two legs of the triad combined are less than the Submarine Force's contribution. That's today. It's about 54 percent, somewhere along those lines.

That's absolutely amazing when you consider we're only eight percent of the Navy officer corps. United States submariners, only eight percent of the Navy officer corps. There are more doctors and dentists in the Navy than there are submarine officers. Twenty-five percent of the warships, 10 percent of the budget, that's a tremendous return on investment, when you consider that for the past seven decades this Force has prevented major power war.

Granted, tragedies like the World Trade Center attack, 9/11, 3,000 plus people died senselessly. But 50 million to 70 million people died in World War II by most estimates, now that's major power war. That's what strategic deterrence has prevented. That's

why in this document the absolute first thing mentioned in the blue line of effort is how strategic deterrence is “foundational to our survival as a nation.” That’s a quote, “foundational to our survival as a nation.”

So if that doesn’t blow you away right there, that 54 percent number, put your seatbelt on because in less than two years when the New START Treaty enters into force, February of 2018, the United States Submarine Force will be responsible for 70 percent of our accountable nuclear warheads. I lose sleep on that. We’ve got a lot at stake here and we’ve got some heavy peddling to do between now and 2031 for the Ohio Replacement Program, as Admiral Caldwell told us last night, to make sure that we can get there from here. We can’t just pull an all-nighter the night before. The dog has caught the car. We’ve got to execute.

Let’s talk about the SSN and SSGN forces as well. It is very clear, if you’ve read any newspaper here in the past two weeks, the statements most notably by General Breedlove, an Air Force General and European commander, and Admiral Harris, the Pacific Fleet commander, say they are only receiving about 62 percent of the subs they need to meet growing threats in Asia and Europe. People recognize the demand, the talk about adding another submarine in FY ‘21. People are starting to get it.

The Submarine Force is the anti-A2AD force, anti-access area denial. Anti-access, preventing the ability to get in; area denial, preventing your ability to move around once you are in. The Submarine Force is, the anti-A2AD force. We are the key that unlocks that A2AD lock that thereby enables a greater naval and joint force.

People recognize that. We can get in under that A2AD envelope. But we’ve got to work on some of the tools that we need once we’re in there, and we’re going to talk about that some more. I know Admiral Richard is going to talk about that as well.

So rolling it all up here. You have this backdrop of what’s going on. More is going to be expected of the Navy. You add in the A2AD piece and here’s my simple little equation at the bottom of the previous slide. More is going to be expected of the Submarine Force.



Subordinate Task Unit Allocation

(Who Does What)

- LOE 1: Provide Ready Forces
- LOE 2: Employ the Force Effectively
- LOE 3: Develop Future Capability
- LOE 4: Empower our People

At the execution level, the most important thing we do

So now I'm going to talk a little bit about LOEs (Lines of Effort) I and II. I'm going to leave LOE III for Admiral Richard to get to because that's pretty much his lane. I may talk a little bit about LOE IV, the people piece. Obviously, we're nothing without the people. The only thing that a submarine can do by itself sitting next to the pier is rust. It takes the people to bring it to life and we do not forget that. But I thought you might want just a little bit of understanding here.





LOE 1: Provide Ready Forces

- Who: operational units; CSS staffs; IMAs; training and logistics orgs
- Focus Areas and Evidence of Improvement (OPR)
 - a. Submarine operational safety (CSL/CSP N7)
 - 1) Resilient teams that eliminate Class A and minimize near miss events
 - 2) Unit strength/vulnerability awareness, and ability to self-improve
 - 3) Continue to embrace the Force Improvement Program and culture
 - b. Deliver combat ready forces (CSL/CSP N7)
 - 1) FRTP optimized for high-end wartime and challenging peacetime
 - 2) Operate combat systems to their full potential

Develop warfighting capability, capacity and endurance

6

From a provider of ready forces standpoint, absolute number one in our minds is operational safety. In October '12, USS MONTPELIER hit USS SAN JACINTO. I was the investigating officer for that, over three years ago now, at this point. So that means to me that every single submariner who was in a submarine Wardroom or part of a Piloting party that was on a submarine on that day has probably rotated off.

The good news is that we have had no Class A ship handling type events in two years, all of '14 and all of '15. But from a statistical standpoint, and just a historical standpoint if you go back and look at some graphs, I regret to say that there's an element of "we're due." Now we certainly don't approach it with that fatalist type of approach. On the contrary, we want to be very proactive about this and not rest on our laurels and make sure that we are taking a very, very hard look at this.

There is a lot at stake for the people in this room who just got a talk about how the dog caught the car. We have got to continue that good reputation we talked about earlier, you have one little

crimp in the armor from some untoward event from an operational safety standpoint, and that brings into question all that confidence we discussed.

So we're very, very conscious of that. As we go down to 41 submarines, we can't afford for a single one to have any kind of a problem, let alone the loss of life aspect for something, God-forsbid, very terrible. So we're very, very conscious of this.

It's absolutely the first thing in the first LOE. We're working hard on the resiliency of our teams. Both Admiral Roegge and I have established some new safety offices within our TYCOM staffs that we've carved out, taken out of hide. The Force Improvement Operational Safety, the FIOS office, for example. We've hired a civilian occupational safety engineer Dr. Kim Culley to help us take a different look at things, not just look at it from the traditional tactical binning of what problems were, or operational binning, but let's look at the human factor aspect of what happened.

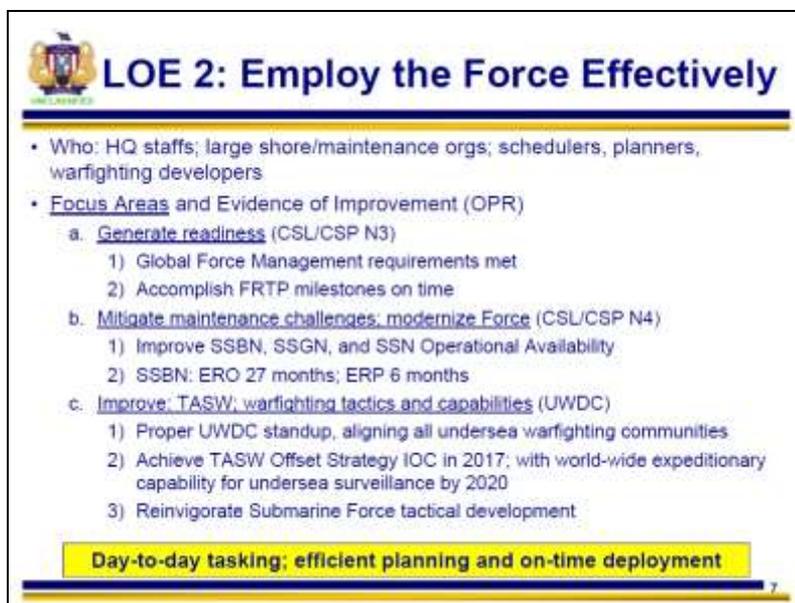
We developed a new attribute sheet as part of how we do examinations and self-assessment. The point is it's about resiliency. We're giving a tool to the CO on what the standard is for how teams should operate and how they should operate in a resilient manner. We've put a lot on this. We're working on getting our lessons learned out in a smarter fashion, creating a continuum of products that the Force can use so it's not just the same old *push* cookie-cutter things are only available from a *pull* standpoint.

We want to be more agile. We want to push things to people. In fact, you can actually report things anonymously now, because the worst place to be is not knowing what you don't know. We don't want that.

So we've created a thing called a Significant Event Report. We took a page from the aviators and their anonymous reporting system. The truth is, I don't think anyone uses it that way, I think we've had one anonymous report in over a year. I don't know if it's just nukes or just in their DNA, they come forward with what happened. But we have seen an increase in our overall reporting and consequently our ability to understand where the issues are,

then get the lessons learned out in a more active fashion. We think this has had a positive effect.

Delivering combat ready forces, this is getting back to the blue line of effort from the Navy Design document, taking a fresh look at our FRTP or the process by which we generate readiness and produce forces ready to deploy. We're taking a hard look at that and making sure, if there is any tuning of that that needs to be done as we look at the high-end fight where it's not just about power projection ashore in uncontested littoral waters, but making sure that we are ready for the high-end contested fight.



LOE 2: Employ the Force Effectively

- Who: HQ staffs; large shore/maintenance orgs; schedulers, planners, warfighting developers
- Focus Areas and Evidence of Improvement (OPR)
 - a. Generate readiness (CSL/CSP N3)
 - 1) Global Force Management requirements met
 - 2) Accomplish FRTP milestones on time
 - b. Mitigate maintenance challenges; modernize Force (CSL/CSP N4)
 - 1) Improve SSBN, SSGN, and SSN Operational Availability
 - 2) SSBN: ERO 27 months; ERP 6 months
 - c. Improve TASW; warfighting tactics and capabilities (UWDC)
 - 1) Proper UWDC standup, aligning all undersea warfighting communities
 - 2) Achieve TASW Offset Strategy IOC in 2017; with world-wide expeditionary capability for undersea surveillance by 2020
 - 3) Reinvigorate Submarine Force tactical development

Day-to-day tasking; efficient planning and on-time deployment

LOE II; if LOE I was really focused on the submarine skipper and below, LOE II is for those major headquarters staffs, the TYCOM staffs, the large shipyard and maintenance organizations, people who schedule and plan. We've really got to work hard from an SSBN standpoint on getting this number back to 27 months for those refueling overhauls. I regret to say that USS MARYLAND just left Norfolk Naval Shipyard after 37 months on that

availability. We can't have that as we go forward, and are working on this transition leading up to Ohio Replacement. With 54 percent going to 70 percent of our accountable nuclear warheads; we've got to get those assets back at sea and not managing it on the margins that Admiral Roegge and I, as CTF-134 and CTF-144 respectively, have to deal with on a daily basis.

The good news is, when we get to the year '19 or '20 the log jam is going to bust open because the EROs are going to be done on the Ohio class. Those EROs were never the plan, right? It was a 30 year ship. OHIO went on patrol in 1981. So five years ago OHIO was supposed to be being decommissioned. We extended it to 42 years.

The longest we've ever done a single submarine, USS KAMEHAMEHA, is 36 years. We're going to take an entire class to 42 years. That's uncharted water. So we have got to get this right, it is a national imperative.

You've heard Admiral Mulloy talk about nuclear deterrent enterprise. We've added to the shipyard manning by 2,500 workers. We've added to Kings Bay by 250 workers.

Let me camp on this next one a little bit, the UWDC, Undersea Warfighting Development Center. For those of you who don't know, DEVRON 12 as you knew it growing up, for those of you who wear dolphins, is gone. It's now SUBRON 12. The special sauce that made it a DEVRON, was this entity called the TAG, the Tactical Analysis Group, it has been pulled out from the DEVRON and is now underneath UWDC, the Undersea Warfighting Development Center.

We are very, very conscious of the fact that we cannot lose our connection with the waterfront. Admiral Trussler knows this very well. We talk about it all the time. He's right there in Groton with the schoolhouse, so there's a tremendous synergy that happens there from an experimental standpoint. We're very, very conscious of how we've got to keep that very, very tight.

Admiral Mies has done a good job of challenging me with things that we've got to do from a TACDEV standpoint and we are on a jihad to improve our tactical development. Admiral Trussler is working on that very hard and we're taking a close look

at all the pieces that contribute to that. It's very, very important to us.

Theater ASW, believe it or not, Admiral Trussler who works for me, I sign his FITREP, he bottom lines the strike group ASW certification for all carrier strike groups. All carrier strike groups that deploy, he bottom lines their ASW certification. And he bottom lines the certification for all theater ASW CTFs: CTF 69, CTF 54, CTF 74, he even bottom lines mine.

But the point is, we're in that business, Navy-wide, ASW from the carrier strike group level up. That's a big change from where it used to be.

But that transition is going very well, frankly better than I think some might have thought. It's getting rave reviews. Everyone is in a pile together working on it and I'm very, very pleased with how that's going.



Fully Aligned with Navy's Campaign Design

A Design for Maintaining Maritime Superiority

Strategic Environment

The United States of America is a global leader in maritime security. The Navy's mission is to ensure the freedom of the seas and secure the maritime commons for the benefit of the United States and its allies.

Looking Ahead

The Navy will continue to invest in modernization and innovation to ensure it remains the most powerful maritime force in the world. This includes investing in new technologies and capabilities to maintain our edge in the 21st century.

Mission Statement

The United States Navy is tasked to be ready to prevent, prevent, and control incidents in operations at sea. The Navy will protect America from attack and upgrade its capabilities to help ensure the freedom of the seas, working with our network of partners. The Navy will maintain maritime security as a foundation for prosperity. These operations will be designed to deter aggression and enable peaceful resolution of any disputes as freely as possible in the United States and its partners. It is essential that the Navy not conduct military operations to achieve other any other.

Core Attributes

Integrity	Accountability	Innovation	Teamwork
The Navy's core values are integrity, honor, and service. Integrity is the foundation of trust and the basis of all our actions. Honor is the respect and admiration we earn through our actions. Service is the dedication to the well-being of our country and our people.	The Navy is committed to transparency and accountability. We will ensure that our actions are open to public scrutiny and that we are held accountable for our actions. We will also ensure that we are transparent in our decision-making process.	The Navy is committed to innovation and innovation. We will invest in new technologies and capabilities to ensure we remain the most powerful maritime force in the world. We will also ensure that we are open to new ideas and perspectives from our personnel and our partners.	The Navy is committed to teamwork and collaboration. We will ensure that we are working together as a team to achieve our mission. We will also ensure that we are working with our partners to achieve our common goals.

Lines of Effort (LOEs)

Enhance our presence at sea from the sea	Advance high readiness readiness in every zone	Strengthen our Navy force	Expand and strengthen our network of partners
The Navy will continue to invest in modernization and innovation to ensure it remains the most powerful maritime force in the world. This includes investing in new technologies and capabilities to maintain our edge in the 21st century.	The Navy will continue to invest in modernization and innovation to ensure it remains the most powerful maritime force in the world. This includes investing in new technologies and capabilities to maintain our edge in the 21st century.	The Navy will continue to invest in modernization and innovation to ensure it remains the most powerful maritime force in the world. This includes investing in new technologies and capabilities to maintain our edge in the 21st century.	The Navy will continue to invest in modernization and innovation to ensure it remains the most powerful maritime force in the world. This includes investing in new technologies and capabilities to maintain our edge in the 21st century.

Page 8



This is the Navy's campaign design on a single page. I'm just putting it up there for effect because I want to show you the next slide.

Fully Aligned with Navy's Campaign Design
A Design for Maintaining Maritime Superiority

Strategic Emphasis
 Commander's Intent - Situation
 - Maritime Domain
 - Rising Challenges

Looking Ahead
 Commander's intent - Situation
 - Changing Future
 - Expanding Undersea Force

Mission Statement:
 The United States Navy, working in close partnership with our coalition partners, provides the foundation of our Navy's deterrence, defense, and control. It ensures our submarine readiness to meet the Commander's Intent - The Mission of the U.S. Submarine Force is to execute the mission of the U.S. Navy in and from the undersea domain...
 a campaign that we carry on through our operations in the undersea domain.

Core Attributes
 Commander's Intent - Concept of Operations: We foster a team-wide culture of integrity, accountability, initiative, toughness...

Lines of Effort (LOEs)

Deliver credible ready forces to operational commanders
 - LOE 1.a. Deliver credible ready forces to operational commanders
 - LOE 1.b. Increase readiness supporting wartime CVLAs
 - LOE 1.c. TAGM and underway refueling tactics/capabilities
 - LOE 1.d. Develop future capability
 - End-state: Own the Box
 - End-state: Own longer Area
 - End-state: Best of the Submarine's Systems
 - End-state: Protect our Strategic Assets and Deterrent Threat

Operational safety
 - LOE 2.a. Operational safety
 - LOE 2.b. Mitigate maintenance challenges, efficiently resourcify
 - End-state: Get on the Same Page
 - End-state: Get Positive

Sustainable Submarine Force
 - LOE 3.a. Sustainable Submarine Force
 - LOE 3.b. Talent management
 - End-state: Set the Best

Expanding Undersea Force
 - Expanding Undersea Force... we work closely with our partners and allies...
 - LOE 4. Coordinate/leading efforts across partners and allies...
 - LOE 4. Requirement and task development, integration, R&D (HA, PA, O&A), industry...
 - Partner/Innovate... integrate with our U.S. partner and allied Navy undersea forces...

UNCLASSIFIED

This is my Commander's Intent overlaid on top. I'm just making the point to you that these two things are right in line. You hold these two things up to the light and they are tight, and that was no accident, I can assure you. We'll talk about Vision 2025, but I think those of you who are familiar with it know that, *get on the same page*, is a big part of how we do business. It's why we're all in this room right here right now, to be honest with you, and this kind of makes that point in spades.



Let me transition to a little bit about the strategy or about the Vision 2025 itself. I'm not going to spend a lot of time on this. You people, I think, are very, very familiar with it. Obviously we've talked about ORP. We've talked about getting a second VPM (Virginia Payload Module) in FY '19. We've talked about restarting the heavyweight torpedo line.

You know, we're going to be building torpedoes again in this country for the first time in 20 years. All of this is in the *own the*



best category: Large Vertical Array; Virginia-class two per year; every single piece of it.



Growing Longer Arms. This is kind of the platform-centric view that has characterized the last 10 to 15 years, this 10 mile or so torpedo and this 1,000 mile or so land attack weapon, an acoustic envelope that's kind of just drawn there from a reference standpoint.



This is what we're working on changing, from a growing longer arms standpoint. It's not just about torpedoes that can go 100 miles. That's certainly part of it, but there's all kinds of ways in which our arms need to grow. This shows it very well, the large vertical array and the acoustic superiority initiatives are helping make that yellow bubble bigger than that reference line, via the TLAM research, the references Admiral Mulloy made to the \$439 million that is in the President's Budget of '17 for advanced capability Tomahawk, putting a seeker on the weapon, that's all part of that right there.

UUVs are a huge part. Admiral Mulloy referred to that as well. He mentioned NORTH DAKOTA, but I want to hit you over the head with what he was saying. For the first time an operational submarine did a real world mission in support of a combatant commander using a UUV. That's what happened there, huge. It's a new world.



That opens up all kinds of things. Your little EM spectrum is no longer just at the top of an antenna coming out of your submarine, but your ability to grow longer arms and have that come from UUVs, large or small, UAVs, that's taking it to another level.

Torpedoes, this is very much in the Grow Longer Arms piece. We talked about some of this here already as well.

Grow Longer Arms

Other Future Missions: ASW, EM Spectrum, YAM No-Cat / HSLAW, Advanced TACTOM Maritime / OASW, Torpedoes, Future UUV, Future UAV, PDS/CO, AS/ASW Capability, Surface Element

- Platform Enhancements
 - VA Payload Module
 - ULSM
 - Acoustic Superiority
 - LVA, Coating, VCS Quieting
 - LPLPD Communications
 - SWFTS
- Weapons Enhancements
 - HWT Restart
 - 3+1
 - ASW releases
 - Advanced TACTOM Maritime
 - Other Missiles
- Beyond platform enhancements
 - Small UUVs
 - 1319
 - Fleet Module / LBS UUV
 - Large UUVs
 - XL UUV
 - LDGUV
 - UAVs
 - Blackwing
 - ZFC Sea Hobbit
- Deployable/Sand systems
 - TASM Offset
 - RUSK
 - Countermeasures/Decoys

Domain-Centric Superiority

PB17 Request Impacts

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This is just a snapshot showing you all the things from the President's Budget '17. I'm not going to spend any time on this. Admiral Richard is going to walk you through that, but for effect I wanted you to get that this is where *the dog has caught the car*. This is a pretty impressive array of enhancements that are helping us achieve this vision. It's real, it's time to execute. Now we have to deliver.



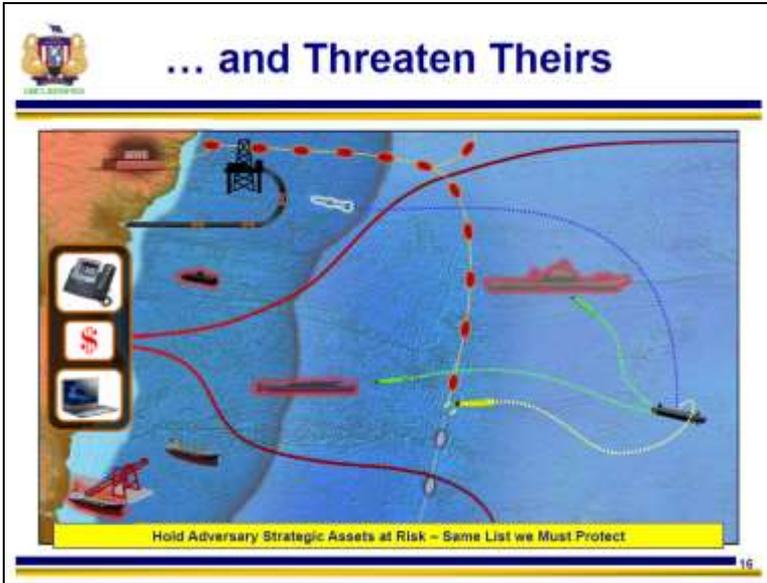
We've got a bunch of things going on with decoys, some of which, most of which, I really can't talk about here. This is part of the vision.





Protecting our Strategic Assets. Again, probably the easiest thing to talk about in this forum is the Theater ASW offset strategy. It's a great example of a scalable re-deployable system, a system of systems, that you can use to protect a carrier strike group, for example, and establish a haven somewhere.

We're getting ready to do an experiment. We just did one in the PAC last week that was very successful. We're going to be doing more of a demonstration here in June and we expect to have some things actually in the water from an operational standpoint here by the end of the year. Very, very exciting stuff, definitely leaning forward on that.



This is one area where if you're a real student of the UDCP and Vision 2025 you might recognize a little bit of a difference. I helped write the original plan so this is not pejorative in any way. But I felt like it was a little bit passive. We were owning stuff and protecting stuff and getting stuff. I wanted to threaten some stuff. Hence the *dot, dot, dot* and *Threaten Theirs* that if you hadn't picked up on is part of this.





I already mentioned this. From a tactical level, obviously very important, probably our next big thing that we've got to get after is from a communications standpoint, LPI, LPD communications. I started working on that a little bit but Admiral Richard is going to take it to another level on his watch. Given that we are inside the A2AD bubble we want to make sure that we can communicate, we can get the target, or we can provide the targeting data, whatever the case may be. That's a big part of some of the stuff that we've got to do so that we can take advantage of those longer arms.

Admiral Roegge and I have worked very, very hard on being extremely tight as a Force. And as I mentioned earlier, this is a very big part of our success. It's part of why we're here today.



The URICs (Undersea Rapid Capability Initiatives) continue at full speed and you see evidence of them in everything, from the Fleet Modular AUV (Autonomous Undersea Vehicle), which really fueled the use of the Remus 600 vehicles and fully was part of how we did project 1319 on the USS NORTH DAKOTA. We're going to do more of those kind of missions. That's URIC number one.

There's URIC number two, that's a decoy. There's a number four, which is the Long Range Precision Strike, including use of a SCEPS (Stored Chemical Energy Propulsion System) engine. This is part of longer arms, from a torpedo standpoint.

There's URIC number five, which has the TRAPs (Transformational Reliable Acoustic Path System) node in it. That's part of the Theater ASW offset strategy which we're operationalizing and taking to the fleet this year. And then you've got the UAVs, the signal injector launched one which is Blackwing, and the torpedo tube launched one which is XFC (eXperimental Fuel Cell).



We've got 118 of the Blackwings in the President's Budget '17, and 13 of the XFCs in the President's Budget '17, for the first time ever. When I was at N97 I actually had an aviation slash chart in the POM submit for the Director of Undersea Warfare. So pretty cool stuff, and we consider them just part of the fire control system and the imaging system. That's how we're treating them. They're an extension of what I showed in that previous slide.

This is part of us getting faster. We can't rely on the 20 year flywheel for new platforms. It's got to be about vehicles. It's got to be about payload on those vehicles. It's got to be about TTP, hence the emphasis on TACDEV. That's all part of the get faster thing, and it's very much in line with the green LOE out of the CNOs Design.



The people aspect, this was also an addition that Admiral Roegge, Admiral Richard and myself thought was important. And, of course, right as we were thinking about adding this, Sailor 2025 came out almost on cue. They even got the year right! Vision 2025, Sailor 2025, very much in keeping with where the Navy is

going and obviously very, very important from a people standpoint.



The slide features the Navy crest at the top left and the title "CSL 2015 Accomplishments" in a large, bold, blue font. Below the title is a grid of four quadrants, each containing a list of accomplishments. The bottom right corner of the slide has a small "20" in a blue box.

CSL 2015 Accomplishments	
<ul style="list-style-type: none"> • Zero Class A Mishaps, 2 Years in a row • Established Force Improvement and Operational Safety Office <ul style="list-style-type: none"> – Numerous associated initiatives • Fully implemented crew rest initiative • Completed EW Wholeness Review • Improved AZAD communications proficiency • Exercised active partnerships with 8 Sub Forces <ul style="list-style-type: none"> – UK, CAN, FRA, NLD, BRA, PER, CHL, COL 	<ul style="list-style-type: none"> • Undersea Rapid Capability Initiatives <ul style="list-style-type: none"> – FMAUV: 1st sub-launched UUV, CCOR msn – LRPS: SCEPS test, land complete; start in-water – TASW Offset: Began prototype development • SECNAV Goal of 10% Inport Energy Reduction
<ul style="list-style-type: none"> • All Global Force Management targets met: <ul style="list-style-type: none"> – Deployed ~1 SSN/month; ~1 SSBN/3 weeks • Highest SSBN OPTEMPO since 2005, + ~2 patrols • SSBN Faslane port visit – first in over a decade • Established U/WDC <ul style="list-style-type: none"> – Developing doctrine; Assessing warfighting; Training the Fleet; Advancing capability/wholeness • Increased TASW training <ul style="list-style-type: none"> – 2x SCCs, 3x CSQ/ESQ FRTP cycles, USFFC MOC • Initiated submarine TACDEV reinvigoration 	<ul style="list-style-type: none"> • Retention/attrition exceeded Navy goals <ul style="list-style-type: none"> – Zone A best among URL communities • Embedded Mental Health pilot complete <ul style="list-style-type: none"> – Transitioning to Program of Record • Women in Submarines <ul style="list-style-type: none"> – ~20% of submarine crews integrated – Over 115 total female submariners – 1st 3 SSNs integrated (JMN, VIR, MIS) – 1st enlisted application cycle complete – Added 19th crew for integration (JWR) • Fully Embraced Sailor 2025 Initiatives

Very quickly, just some accomplishments from SUBLANT’s standpoint. These are actually organized by LOE’s; this is LOE 1, this is LOE 2, this is LOE 3, LOE 4. I mentioned our safety record that we have, but we cannot rest on our laurels. We’ve got to continue to push forward there.

We implemented the Crew Rest Initiative. I think it was last year when Admiral Mike Connor was standing on this stage he made the comment that he spent the first 15 years of his career tired. We’ve taken some steps to work on that.

In a satellite environment, which is what we’re getting at, we’ve got to be able to communicate in ways that aren’t dependent on that. We’ve worked hard for the past year or so at improving our ability to communicate from an HF standpoint, not reliant on satellites, so going *back old school*. And we had to sweep out some cobwebs, but we’ve made tremendous improvements. No



surprise, if you practice you can get good at it, or get good at it again.

Partners are obviously key. These are just my partners. Admiral Roegge's got as many if not more in the Pacific. This is pretty impressive.

I know I've been talking about our availability and maintainability, and we've got to work on that. But the fact that we are able to generate one SSBN (this is just LANT numbers, it's even bigger if you view the whole Force), every three weeks and one SSN on deployment every month, that is hard work. That's what it takes to have a Force that is forward and projecting power, taking it to the other guy. You can't do it without that, and that really is tremendous.

Faslane, our first SSBN port visit in over a decade to Faslane, Scotland, huge. Talk about showing support with the allies, showing support with NATO, demonstrating to the world that we patrol everywhere in the Atlantic. You don't need to come into our house to find us, because proving that we're up there, that's huge. It's very, very important. We hit the long ball on this one, and we look forward to more.

Women in submarines, lots of first in 2015. We have about 20 percent of our crews are now integrated, over 115 female submariners in our Force. The first three SSNs were integrated in '15: MINNESOTA, VIRGINIA and MISSISSIPPI.

We're starting to work on SSBNs. We had the first application cycle for MICHIGAN. It's complete. We've got the second one in progress now and we've actually added a 19th crew.

A additional SSN because we wanted to have one in Norfolk, if you look at all the other three concentration areas where the submarines are, where we're integrating women, it was Kings Bay, Bangor, Groton places where there's not necessarily a large non-submarine Navy population. A lot of the women who are married, their spouses are in the Navy too, but not necessarily submariners. So if they're married to a Navy JAG, a Navy pilot, we wanted to have a sub that was in a place like Norfolk, where there is a large concentration of other than just Submarine Force assets. That's actually a Sailor 2025 initiative.

**NAVAL SUBMARINE LEAGUE
2016 CORPORATE MEMBER RECOGNITION DAYS**

**REAR ADMIRAL CHARLES RICHARD, USN
DIRECTOR, UNDERSEA WARFARE N97**

March 10, 2016

Good morning, you all. It is great to be up here. Admiral Padgett, sir, thank you very much for the introduction. Well I'm smiling just a little bit, right, because one, I was thinking about getting a lapel mic and trying to do what Joe Tofalo did. They made me a bunch of cards up here, and it kind of all comes back to the really sharp staff at N97, Martin Sprague back there that did a lot of work putting this together. You saw Joe start off with just kind of a couple of off-script comments. Well my staff came to me long before this thing and said, Admiral, in your case that's a really bad idea.

We need you to stick to the script. Martin's already blowing in a paper bag back there in terms of – God, he's doing it again. But this is all just part of the – I think this is a fabulous time to be a submariner. I've stood up here before and said that to you in the past, and it's not like there ever was a bad time to be a submariner, or not a good time.

But I think Admiral Donald hit it last night when he said we're at an inflection point of sorts as we look into the future. Some of the speakers have already talked about the changed world order that we see. And the Submarine Force is well positioned based on the inherent physics of the domain that we operate in, the capabilities that we provide, the hard work of those that have gone before us.

And so you're going to see us do things. Stealth is always going to be the cover charge to get into our domain to go do our missions, right? But there are other missions that are coming on the table. There are other capabilities that we're building in.

I'm going to give you some examples of where we're headed in the future, but that's part of why I say this is a great time to be a

submariner. I think when we get the slides up I'll go ahead and give you some more examples of exactly what I'm talking about.



This slide is: UNCLASSIFIED

PB17 Assessment

<ul style="list-style-type: none"> • NDER / OHIO sustainment OHIO Replacement 	<p>Funded; FY16 adds maintained by Congress</p> <p>Funded; Minimize impact to Navy shipbuilding</p>
<ul style="list-style-type: none"> • VA class 2/year thru FY21 	<p>Funded; 1/year in ORP years</p>
<ul style="list-style-type: none"> • VPM on all BLK V-VII (20 total) 	<p>Funded; ALL starting w/ one SSN in FY19 (19 total)</p>
<ul style="list-style-type: none"> • Acoustic Superiority (LVA) 	<p>Funded; VACL (BLK III / IV) Backfit/ OHIO Backfit/ NEWCON</p>
<ul style="list-style-type: none"> • HWT Restart Missile Portfolio 	<p>Funded; Sustained investment required</p>
<ul style="list-style-type: none"> • Unmanned Vehicles 	<p>Funded; Fleet delivery starts in FY17</p>
<ul style="list-style-type: none"> • SWFTS 	<p>Funded; Sustained investment required</p>

POM-18
Challenging

Navy and DoD "double-downed" on Undersea Investments

2

First, let me start off – remember future capabilities, requirements and resources. That's what we do in N97. So I'm going to give you a quick portfolio update.

I do this with some humility, right? You just got a prime standard alignment from Admiral Mulloy, so I'm just going to attempt to pass the alignment check here. But what I've got them binned in is in the priority order, the sort of Submarine Force priorities.

I want to display to you the PB17 enhancements referenced against our priorities. Know that those priorities should look very familiar to you. They're the same ones I put up last fall and that you've seen the force put up over time.

There's power in that. There's consistency. There's alignment. Admiral Tofalo was talking about that earlier.

Those priorities come from the Integrated Undersea Future Investment Strategy. That strategy comes from Commander's Intent. That goes back to *The Design for Maritime Superiority*.

Know that that alignment continues down. If you were to see Admiral DelToro's science and technology objectives, they're lined up with what we have in the IUFIS. If you see what Admiral Trussler is doing, you're going to see that alignment. I submit that we're one of the best communities in terms of maintaining that alignment between all elements of what we're trying to do, and I'm going to demonstrate to you how that all played out for us in PB17.

To start, you remember strategic deterrence is job one. It's our highest priority. It's why it's first on the slide. In terms of sustaining the OHIO Class, we maintained it. It was about \$2.2 billion in FY16 adds that came out of the NER, and we were able to add a little bit more to that coming through in PB17.

You saw Admiral Mulloy talk about the OHIO Replacement. That is funded in PB17, including \$2.3 billion of additional SCN in '21, so we're beginning to see the beginnings of the relief that will be necessary. And remember, this is not a question of whether or not we're going to pay for OHIO Replacement. That is our number one priority. This is about minimizing the impact to the remainder of the Navy, and that's important as well.

We have Virginia-class at two per year as the goal, at least through FY '21. In PB17 we have one per year in the OR years. I'll show you a little bit more about that in a future slide and the opportunity that we have to potentially do better than that and do a significant step in addressing the shortfall in attack submarines that we face in the future.

There's great news on the Virginia Payload Module (VPM). We came into this POM cycle at one per year. We walked out at two per year starting in '20. So basically, with the exception of the first one, all Block 5 and all follow-on Virginias are VPM. I'd ask you to start thinking about it, that's just what a Block 5 Virginia is going to be. We'll almost stop talking about VPM as a separate thing. That's just a characteristic of a Block 5 Virginia.

So after we went after strategic deterrence, after we went after

force structure, then it's a class of things that enhance our asymmetric advantage. Again, in most of these I'm going to go into a little bit more detail, but once you have access, what do you do with it? We can do plenty today. Here's how we're going to expand the capabilities that we provide back to the force, and that includes acoustic superiority.

The bottom line is acoustic superiority is funded on just about everything, Ohio back-fit, Ohio Replacement and new construction, Virginia-class new construction, and Virginia-class back-fit on most Blocks 3 and 4. I'll have the numbers later on.

Heavy weight torpedo restart, put that one in the done pile. The line is coming back up. The RFPs are on the street and after many years of hard work we're back in the business of making heavyweight torpedoes. I've got some other exciting news in terms of both heavyweight torpedo prototyping that's going on, and I want to dive into our missile portfolio, all of that added inside of PB '17.

A big effort inside of unmanned vehicles that I'll talk some more about. Again, you saw Admiral Mulloy point to SWFTS. So the bottom line, as Admiral Tofalo mentioned, the Department of Defense is endorsing with resources the capabilities that are provided to the combatant commanders by the Submarine Force. I'm kind of fond of saying that this goes beyond speeches. They are providing resources to endorse the capabilities that we provide.

That said, we're in the middle of POM18. Of course, I'm not allowed to talk about where we are with POM18 because that's pre-decisional. That's kind of a Pentagon way of saying anything I was to say about POM18 now I'd just be wrong. So it's better that I just don't tell you anything about it yet. It is a very challenging environment.



This slide is: UNCLASSIFIED

OHIO Replacement Update

- FY15 accomplishments
 - Joint Staff Validated CDD (includes LVA + space / weight for coating)
 - CNO / ASN RDA Stackley – Gate 4 review complete (established technical baseline)
 - OSD AT&L Kendall – RFP DAB complete (supports detailed design development)

- Key FY16 dates

- MAY 2016	First Article Quad Pack (FAQP) Construction Readiness Review
- AUG 2016	MS-B

- FY17 includes incremental funding within the FYDP

- Coordinated and integrated approach
 - Maintaining acceptable margin for OHIO through EOL
 - Delivery of ORP by 1st QTR FY31
 - » Two Nations: United States and United Kingdom
 - » Two Executive Departments: DoD and DoE
 - » Multiple budget lines to fund

- Cost alignment (will be updated to support MS-B)

- Lead Ship w/o plans (TY\$)	\$8.8B	
- Avg follow-on ship (CY10\$)	\$5.2B	TH: \$5.6B / OBJ: \$4.9B

OHIO Replacement remains on track – Monitoring Risk

Let me start first with an OHIO Replacement update. When I go to this slide, I have two lists that I keep, among several, one of which is things that make me proud to be an American, and things that I worry the nation takes for granted. There are plenty of both on this slide.

It has been a great year for the OHIO Replacement Program. The vice chairman validated the CDD, a major accomplishment inside the JROC process. The CNO and Secretary Stackley personally chaired the Gate 4 Review.

On that list, by the way, of things that make me proud to be an American is most of the things that PEO Submarines does. When you watch those guys in action—that was a very challenging Gate Review and they did a very phenomenal job. I don't want to get into too much of Admiral Jabaley's knickers, but when you see how that Virginia program executes across the board, it makes me proud to be an American and gives me great confidence when we're able to go off and do things like this. Another big one on that list is the request for proposal DAB that was completed with

Secretary Kendall. So a great amount of accomplishments in Ohio Replacement in FY15.

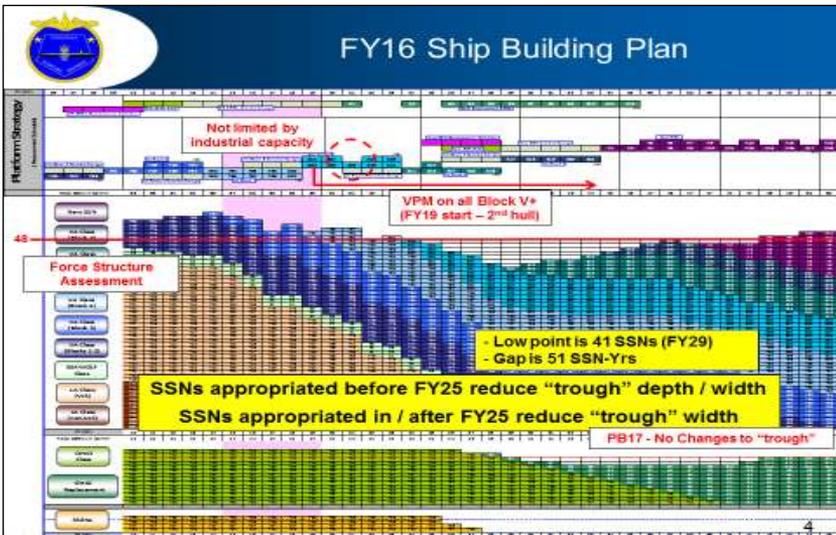
But at this point, it's like, stop the music, right? It's a very good news story but we have a lot of challenges ahead of us. We're going to show you a glimpse of them here for this year.

I'm constantly reminded of what Admiral Richardson told us about a year and a half ago in a speech to the Submarine League. I keep that speech on my desk. I'm jumping ahead a little bit.

We say things like coordinated and integrated approach. Those are kind of Pentagon-ish buzz words for the very hard work that is required and remains to be done to continue to get OHIO Replacement in on time. I captured some of the highlights.

Remember, we've got six lines of effort, two nations, two executive departments, multiple major budget lines to fund. We have to keep all of this in coordination. All the pieces have to come together. Whatever your role is inside of this, to borrow Admiral Richardson's words, you've got to have your shoulder to the blocking sled. You've got to keep your legs pumping, and we have to continue to move forward.

Finally, we're in the process—I show some cost numbers up here. Those are in the process of being updated in Milestone B, which is the major event, among several, that are coming up later this year.



Here's the eye chart. I couldn't be a nuke without putting up a whole bunch of detail. But again, this goes back to one of the reasons that we have such success. And I don't even want to describe it as winners and losers. It's when we go make a case for resources we can present compelling arguments why we're a valuable investment because of the rigor of the work that we do to set it up.

So this is your attack and guided missile Submarine Force structure. This is the shortfall that we're talking about. It begins in '25 and bottoms out in '29. Right now that is 41 boats under a requirement of 48. Then we show you the total number of SSN years here at 51.

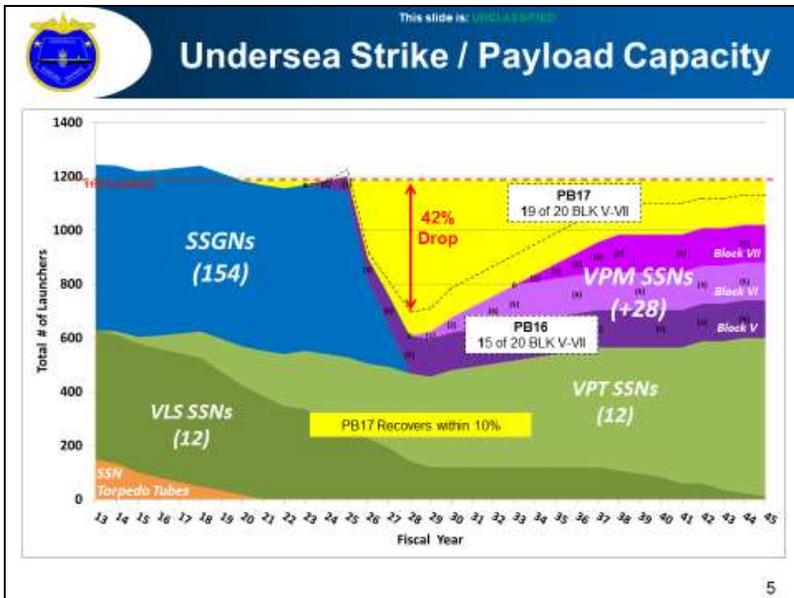
Just a couple of things I want to highlight on this. I'll start with, the requirement is 48. That number has been around for a long time. That was actually last validated by OSD in 2005. It builds on work that had been done years up to that.

Admiral Tofalo just gave us a very good overview of the number of assumptions that went into that force structure of 48 that just aren't valid anymore, right? And so, we've done a lot of work inside of N97 to capture with analytic rigor what has changed about those assumptions. We're feeding those into the force structure assessment that is underway inside of OSD. I think that there is a very good case to be made that 48 is insufficient and that the number will be higher. We'll know when that force structure assessment is complete.

Another key point that we work through is the fact that when you see the ramp in here—two Virginia per year as Ohio Replacement comes in—these are the actual new construction ships and their building block approach. As we ramp up with VPM, OHIO Replacement, and continue with two Virginias, we're not limited by industrial capacity. That was a key conclusion that came out of a sub study, and it opens up an opportunity here in FY21.

So yes, Admiral Mulloy said that there are a number of priorities inside the Department of the Navy, but we have a tremendous opportunity here to continue a two per year build rate. I think some of you may have heard Secretary Stackley talk about this up

on the Hill. We can show a very good case as to, if we were to have a second Virginia in '21, the effect that it has on the trough as being pretty significant. We want to make the case that we don't want to miss this opportunity of a very large thing that we can do to address this shortfall. And we also show the Virginia Payload Module starting here on all Block 5 and follow-on ships.



Another challenge we face, strike capacity, right? This drop is when the guided missile submarines come off line. What I wanted to show you with this—I think you're familiar with it—this is the strike capability, really number of launchers, which come back as the Virginia Payload Module SSNs come online.

This is what the add in PB17 did for us. That was a pretty significant chunk of attempting to address that shortfall. The bottom line with that additional investment is we'll eventually recover to within 10 percent of our strike volume.





This slide is UNCLASSIFIED

Acoustic Advantages

ALL TB-29A "Green"

Rapid Prototyping of Next Gen Telemetry

Improved telemetry: fewer connections, wires, and lower power

Compact Towed Array (CTA) – L3 Chesapeake Sciences Corp:

- 2 TB-29A fielded, 7 more in production
- 1 delivered (SSN771) – install MAR 16

Inverted Passive Electrical Network (IPEN) – 3 Phoenix:

- 1 TB-29A fielded, 2 more in production
- 2 TB-23 fielded, 1 more in production

TB-29X

- Equivalent acoustic performance capability to TB-29A
- Increased reliability using Next Gen Telemetry
 - Reduction in single points of failure
 - Reduced power, fewer connections
 - Incorporate developmental array lessons learned
- Contract award in FY16 for first array
- Fleet delivery beginning in FY17

Acoustic Superiority Program - \$907M (FYDP)

- ✓ Large Vertical Array (LVA)
- ✓ Advanced coating
- ✓ Quieting
- ✓ At-Sea testing will begin in 2020



SSBNs:

- OHIO: Install LVA on SSBN 734 to 743 during scheduled ERP
- OR: LVA installed during NEWCON; Advanced coating TBD



SSNs:

- SSN 790: Install during PSA
- Blk 3/4 (11 hulls): Install during first EDSRA
- Blk 5/6/7 (20 hulls): Install during NEWCON

Game-changing enhancements beyond Towed Arrays
6

So across the board, investment providing capabilities that are providing us with enhanced asymmetric advantage is part of why I stay so excited. More traditional, towed arrays. We're in a fleet now where they're all green, right? So we have improved them and addressed what had been a reliability issue for us.

Rapid prototyping of—nextgen telemetry is one of the best ways to go and improve an array. We're in the business now of bringing in the TB-29Xs. You'll get the first ones in there in FY17.

We've alluded to the Acoustic Superiority Program. Admiral Mulloy talked about the investment that we have made there. The bottom line is I'm proud to be in a force that still has the rigor to know its physics, go look at something, analyze it, find an opportunity, do the rigorous engineering, do the rigorous analysis, and then make a case inside the Department of Defense that results in about a billion dollar investment in this to sustain our acoustic advantage and take advantage of the opportunity.

So that's your Large Vertical Array, advanced coating, some quieting. We say at-sea testing will begin in 2020. That will build

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JUNE 2016

on the good work that is already underway on USS DALLAS and now USS MARYLAND. We have it funded for all the OHIOs, all the OHIO Replacements, and then the Virginias, as I talked about, including the back-fit boats here.



This slide is: UNCLASSIFIED

Undersea Weapons

- Mk 48 ADCAP Heavy Weight Torpedo
 - Restart production in FY16 to close ~30% inventory shortfall
 - Procurement of CBASS Kits continues to convert MOD 6 weapons to MOD 7
 - Programmed upgrades to MK48 ADCAPs continue for added capability: APB6 & APB6/T11
- Integrated Submarine Torpedo Plan (ISTP)
 - PB17 (FY17/FYDP) \$36.8M / \$289.5M
 - OSD funded RDT&E for an Operational Prototype
 - Modular payloads, advanced propulsion, and advanced navigation
- Tactical Tomahawk Weapon System (TTWS)
 - Tomahawk Blk 4 Recertification / Modernization on track to commence in FY19
 - PB17 (FY17/FYDP) \$36.0M / \$439.0M to fund development of a Maritime Strike Capability
- Next Generation Land Attack Weapon (NGLAW)
 - Initial Capabilities Document in staffing for approval
 - Analysis of Alternatives begins FY16, Developmental Phase to begin FY18

Broad Navy and DoD initiatives for undersea weapon capabilities

7

Weapons. Again, exciting times for the work that we're doing on our weapons. As I go through and talk about each of these, remember that we are looking at end-to-end, how you employ them, right? We had been fond of using the term *kill chains*. You may now hear us start talking about *kill webs*, to try to capture—a kill chain is kind of a linear two-dimensional simplification of the way the actual fleet works.

So not only are we doing heavy weight torpedo restart, we're in the business of addressing our 30 percent shortfall. We're continuing to upgrade our weapons, and working hard to now add capacity on top of the ability to provide new weapons. That's a part of the broader integrated submarine torpedo plan.

In a very exciting investment by OSD, they put in almost \$300 million for us to go off and build a small number of prototype

torpedoes with radically advanced capability than the ones that we have in the fleet today, to go after some of the things that you saw Admiral Tofalo talk about. So this is not PowerPoint. We're getting rapidly to the point that we're bending metal, putting things in the water so that we can go start testing exciting new developments.

The same thing with the Tomahawks. We're working with the surface warfare N96 crowd as we get back in the anti-ship cruise missile business. The Submarine Force will be a player in that as well, and other exciting missile work.

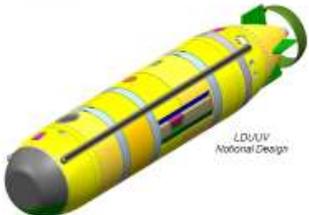
And again, beyond that we're beginning the work to go figure out what follows Tomahawk. What is the next generation land attack weapon capability? All of this with investments in targeting, communications—remember, we're the penetrating portion of the kill web. We're the force that has access. How do we better leverage that both as a part of a broader fleet or independently if necessary to be that key that unlocks the A2AD door?



This slide is UNCLASSIFIED

Progression for Fleet Scale UUVs

- Vision: by 2025...
 - Family of UUVs
 - Multi-mission payloads
 - Launched from various platforms
 - Configurable sensors / mission packages
- Challenge: fleet scale utility
 - Today vs. tomorrow budget decisions
 - Decisions effect technology gap
- Solution: shift today / tomorrow dialogue
 - Align mission / capability requirements
- What to expect: more UUV fleet experience
 - 16 LBS AUVs to Fleet starting FY17
 - DDS launched first / then TTL
 - 4-3-3-3-3 buy plan
 - XLUUV prototyping / experimentation
 - LDUUV procurement
 - Acquisition strategy under review w/ N99
 - IOC / FOC dates holding
 - ULRM (LDUUV enabler)

LDUUV
National Design

Leveraging today's UUV success... AND investing in tomorrow's technology

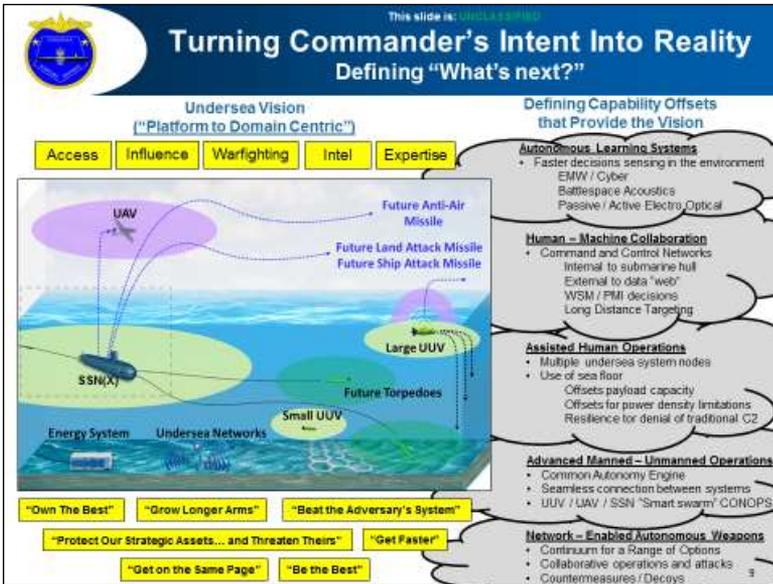
UUVs. I think some of you all may remember Admiral Caldwell mentioning a challenge that he had given me and the force more broadly to move out on UUVs. Frankly, that's kind of closer to putting a defibrillator paddle to the process. We are really going to move out in terms of what we're doing.

Look, we have a vision for UUVs. We've had one for a while. It's like Admiral Mulloy talked about this morning, it is a vision of a family of unmanned undersea vehicles.

We don't have one aircraft sitting on a carrier air wing. They have a family of aircraft that go off and do the missions. We see something like that undersea: a family of small, medium, some that are too big to come off a submarine. They'll come off a pier, they'll come off a surface ship. This is about getting missions accomplished, so multi-mission payloads, various platforms, reconfigurable sensors and mission packages.

Our challenge at this point is to move beyond the prototyping and the small numbers and get this up to fleet scale, and we're taking the first steps on that. OSD helped us, so in addition to – Joe Mulloy showed you the bigger picture. Those are the two off North Dakota on the real world mission that Admiral Tofalo talked about. Sixteen more are coming inside the '17 budget. We show you the buy plan here. The five that he referred to are in this XL-UUV prototype in experimentation, as well as the work that is going on with LD-UUV.

Some have asked about our relationship with N99, who is the resource sponsor in this portion of the development for these things. I won't say that Admiral Girrier and I complete each other's sentences, but we're kind of close to that. We're working very well and we think we're setting the model for what was intended by the creation of N99 in terms of our relationship with them working it early, us taking it post-milestone B. LDUUV will be the first test of that.



So here's the slide I wanted to give you. I've been sort of working current, out. I'd like to go all the way out to commander's intent in the vision and give you an idea of how we're working.

What I think our task is, is to make Joe Tofalo's vision real. So in each of the areas that he pointed to, we are working to provide better definition to the point that we can start heading

towards requirements. This is a long way of telling you that we're in the process of updating the Integrated Undersea Future Investment Strategy.

So the one that you have, I want you to know is a document that is active. We think about it. I'm working on getting you the next one, so that's not something that will wind up on a shelf never to be seen again, areas like: electromagnetic maneuver warfare, use of the seabed sea floor, unmanned undersea vehicles, and then where we're going on the new SSN. All of those are actively being worked, processes inside the enterprise, and then ultimately I'll continue the conversation with you in the executive summary of the IUFIS when we put out an update on that, probably later this year or early next year.

The other one I wanted to show you real quick is, I've shown you these bubbles off on the side. I don't want to go into a whole lot of detail, but before they were organized in a sense: decide, act, and I put a domain of a seabed in there. That's aligned with the N9 warfighting narrative that comes from the CNO's design.

This uses the terms—this is another way of looking at it using third offset terminology. We are very fluent in that. And the piece I'd ask you to remember is when we talk third offset, we tend to get very focused on human-machine collaboration, autonomous learning, assisted human operations. It's important to remember the derivation of all of that, and it comes back to we the Submarine Force are a key asymmetric advantage that become part of the third offset.

We're the beginnings of where this came from. Remember, this is the third offset. There's a second and a first offset. It's sometimes easy to oversimplify those.

Second offset, Air-Land-Battle, was look deep, shoot deep. If you just camped on look deep, shoot deep, you missed the essence of what they were trying to do. My point here is that you have to understand the pedigree of where these came from to know that we were the beginnings of the thinking of the third offset to begin with.



This slide is: UNCLASSIFIED

Submarine Force Top Priorities

- Provide a survivable and effective sea-based strategic deterrent
 - OHIO Replacement: The Navy's #1 priority
 - OHIO: Restore and maintain acceptable margin
 - New START: ~50% to ~70% of accountable nuclear warheads
- Deliver force structure for global presence
 - Maintain at least 2/yr VIRGINIA-Class SSNs to reduce the "shortfall"
 - Successful execution of 60 month SSN construction span
- Enhancing our asymmetric advantage
 - VIRGINIA Payload Module on all Block V-VII SSNs
 - Acoustic Superiority
 - Increase Heavyweight Torpedo Inventory: Mk-48 ADCAP Restart
 - Increase Heavyweight Torpedo Capabilities
 - Expand missile portfolio
 - Small and Large Displacement Unmanned Undersea Vehicles
 - Universal Launch and Recovery Module

Broad Leadership Support – Making Significant Progress

1
8

So this is what I had put up as the Submarine Force's top priorities: OHIO Replacement, force structure, enhanced asymmetric advantage.

This slide is: UNCLASSIFIED



Submarine Force Top Priorities

- Provide a survivable and effective sea-based strategic deterrent
 - OHIO Replacement: The Navy's #1 priority
 - OHIO: Restore and maintain acceptable margin
- Deliver force structure for global *posture*
 - Maintain at least 2/yr VIRGINIA-Class SSNs to reduce the "shortfall"
 - *Execute on time or early SSN construction / delivery timelines*
 - *Block V+ includes VPM*
- Enhancing our asymmetric advantage
 - *Acoustic Superiority*
 - Increase Heavyweight Torpedo Inventory: Mk-48 ADCAP Restart
 - Increase Heavyweight Torpedo Capabilities
 - Expand missile portfolio
 - Small and Large Displacement Unmanned Undersea Vehicles
 - Universal Launch and Recovery Module
 - *Logical first step toward 3rd Offset Strategy / Vision 2025*
 - *Promote from "what's next?" slide (e.g. LPI / LPD C2, EMW, seabed, etc...)*

Updating IUFIS to identify "what's next" ...

11

This is what happened in PB17 and how we're going to update it: posture, to show more about we're out there in the three point stance ready to deter conflict and engage if necessary; at least two Virginia per year; showing the Block 5 now includes VPM; moved up increasing heavy weight torpedo inventory.

And then finally as these move up, the key one I wanted to show you is, what is next to come up here? What is the next thing as we take things off the list, as we achieve success in the resources? What's the next one to come on?

I'll convince Admiral Tofalo what I think the next one ought to be, but I'll tell you the early candidate right now is electromagnetic maneuver warfare. It's LPI/LPD comms. It's UAS comms. And the first step is down a broader vision down that path.

So with that, I thank you all and I'd be happy to take a few questions.

ADM. MARK KENNY: Admiral, Mark Kenny. I noted you added acoustics superiority there. We have heard that there is potentially

some movement to move funding and focus from acoustic into EW and other areas, an attack that we've fended off for years from those outside the Submarine Force. So it's somewhat surprising that we would want to tinker with or break that model where we have the advantage. Maybe you can't talk about it or maybe it's ongoing, but it's troubling to hear that, not so much as an industry member, but as a submariner.

ADM. RICHARD: Well, going all the way to we are moving funding might be a bit of a stretch inside that. We are always looking at the balance of capabilities that we provide to a submarine relative – acoustic relative to EW, relative to imaging, and all of the capabilities that SWFDS provides. I think we'd be remiss if we didn't take a look at the total sum of capabilities we're providing to our ships relative to the missions that we're asking them to do.

No one is talking about squandering an acoustic advantage. I go back to, no matter what future you think about – I mean, there's some very difficult questions. What competitive environment do you think you're going to be in in 2040? It may not be the one that you grew up in.

But in any future that I see coming, stealth, acoustic superiority, will be required to be there. That's your cover charge. If you can't pay the cover charge you're not going to be on the field to get a chance to play.

So there's plenty of rigor and acknowledgement of that's a crown jewel to be guarded. But I do think it's appropriate for us to look at the balance of capabilities that we're providing to our ships given the missions that we're asking them to do and the environments they're going to have to operate in.

ADM. KENNY: Thank you, sir.

ADM. RICHARD: Admiral, just one more thought on that. There's a couple of things out here where the force is going to have to potentially think radically differently than it has in the past. I think – for example on electromagnetic maneuver warfare

we're going to have to get out of a world where the only question we're trying to answer is, has my periscope been detected, to one where I am domain-centric. I may be the only aperture here. I need to understand what's happening in spectrum. I need to be able to exploit it. I might need to attack and I'm going to have to tell somebody else so they can take action on it at operational or theater scale. That's just one example of it. It's opportunity, but it's a challenge that we have to think our way through.

MR. JOHN PADGETT: Thank you, sir. I've probably been watching too many debates, but can I have 30 seconds here to reply to that? I agree 100 percent, the missions that you're talking about and the sensitivity of that and how that threatens our stealth as much as anything. And from our position, we can be a more capable platform to do those missions. Seeing the budget and the focus from the Navy back into capability, a little less so in LCS, in the numbers, why we would have to have that tradeoff between what you called our crown jewel and our kind of price of playing poker, why wouldn't we maintain that and then make the –

ADM. RICHARD: Sir, I haven't had to make that trade yet.

MR. PADGETT: Okay, thank you.

ADM. JAY DONNELLY: Admiral, Jay Donnelly.

ADM. RICHARD: Yes, sir.

ADM. DONNELLY: On your slide where you spoke to your UUV vision, you showed a four, three, three, three, three buy plan for UUVs.

ADM. RICHARD: Yes, sir.

ADM. DONNELLY: Could you say a few more words? That's the first I've heard of that in any forum.

ADM. RICHARD: Okay, so I'm guilty of maybe making too many assumptions. That is the '13 – '19, basically the Remus 600 vehicles. This is what was used on NORTH DAKOTA. It's exciting, real world missions, CONUS operations and great acquisition strategy.

There's already an existing program of record, the LBS-AUV, we simply came on with them. So it didn't have the overhead of a new program start and able to pretty rapidly get capability out to the fleet. That is the buy program. DEVRON 5 does the operations. We're looking at the manning piece of that. We're looking across the board at man, train and equip.

So I was excited to see an endorsement of that by OSD as a good place to go put some money. This morning at breakfast Admiral Mulloy talked about 16 smaller UUVs plus five bigger ones. The 16 are the 4-3-3-3-3, that is the 16 that he was referring to, and the five are the numbers related to the XL-UUV, which is still an S&T INP-type effort out of ONR.

ADM. DONNELLY: Great, that helps. Thank you.

MR. : Admiral, good morning, and thanks. Just a little bit of a follow-up on UUVs, represented here you've got industry that shares every bit your commitment for innovation and developing new capabilities. I wonder if you might be able to share your view of how the government labs, what the role of industry might be, particularly in UUV development here in the near-term?

ADM. RICHARD: Well, your question is almost better answered over on the acquisition side. But I'll tell you one thing, I want to deliver capability to the fleet. I think I'm behind the curve in getting capability out there so we can learn. One of the challenges here is we have so little operational experience. It makes it hard for someone like me to write requirements because we just haven't operated. I need more data to be able to go do that. The fleet needs more experience.

So what's the best way to go do that? A key piece here is we

have done a lot of work over time, both in industry and the lab organizations. Let's make sure as we go forward we don't leave that on the table, that we harness the work that has already been done and don't inadvertently or inadvertently go back to scratch in some areas and attempt to redesign a wheel after we've spent some money in other place, and we actually have good technology on the shelf, and we don't let ourselves get in each other's way in the process of getting that capability out to the fleet.

MR. : Thanks, I think I'll ask the question again of the acquisition folks.

ADM. PADGETT: Thank you very much.

ADM. RICHARD: Thank you, sir.

THE SUBMARINE REVIEW

THE SUBMARINE REVIEW is a quarterly publication of the Naval Submarine League. It is a forum for discussion of submarine matters. Not only are the ideas of its members to be reflected in the **REVIEW**, but those of others as well, who are interested in submarines and submarining.

Articles for this publication will be accepted on any subject closely related to submarine matters. Their length should be a maximum of about 2500 words. The League prepares **REVIEW** copy for publication using Word. If possible to do so, accompanying a submission with a CD is of significant assistance in that process. Editing of articles for clarity may be necessary, since important ideas should be readily understood by the readers of the **REVIEW**.

A stipend of up to \$200.00 will be paid for each major article published. **Articles accepted for publication in the REVIEW become the property of the Naval Submarine League.** The views expressed by the authors are their own and are not to be construed to be those of the Naval Submarine League.

Comments on articles and brief discussion items are welcomed to make **THE SUBMARINE REVIEW** a dynamic reflection of the League's interest in submarines.

Articles should be submitted to the Editor, **SUBMARINE REVIEW**, 5025D Backlick Road, Annandale, VA 22003-6044.

**NAVAL SUBMARINE LEAGUE
2016 CORPORATE MEMBER RECOGNITION DAYS**

**REAR ADMIRAL MICHAEL JABALEY, USN
PEO SUBMARINES
MARCH 9, 2016**

Thank you, John, one of the more interesting introductions. I want to make two apologies, first of all. My remarks are going to be fairly high level and fairly focused on shipbuilding. I'm not going to get down into the details of combat systems and weapons and where we're headed in those. I think, actually, Joe Tofalo and Chas Richard have done an excellent job of covering them so far. And so with only 30 minutes, I want to focus on what is keeping me up at night and what we're really, really working towards.

The second apology is that I'm going to leave right after my remarks because I have to go brief the appropriators. We're starting today with HAC-D. This is the first year where Tim Prince has not been on HAC-D, and so we're meeting his replacement and hopefully getting off to a good start. We've been briefing the authorizers already and have had great success at getting our message across, and great signals of support from them. But, of course, the appropriators who actually put the money in the budget, that can be a different story.

**Submarine Authorization
FY16 Shipbuilding Plan**

FY	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	Total
	VCS Block V					VCS Block VI					VCS Block VII					SSN(X)		
Non-VPM	1																	1
VPM	1	2	1	2	2	1	2	1	1	1	1	1	1	1	1			19
SSN(X)																1	1	2
SSBN			1			1		1	1	1	1	1	1	1	1	1	1	12
Total	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	34

NSI-Corporate Benefactors 3/10/16 Distribution Statement A

I may have dozed off a little bit, but I think the analogy is, I'm the dog that has caught the bear and is now trying to eat it.

Some days that bear eats you. Some days you eat the bear. But this is what we're facing. This is an expanded version of what Chas Richard showed with his chicklet chart where he said, the building blocks are up above. That's what this is. When you look at this you need to think of two things, challenges and opportunities.

The challenges of continuing to build two per year Virginia-class submarines, adding in VPM, adding in acoustic superiority, and now building the Ohio Replacement Program at the same time, all the while we have teams going off and starting to think about the next SSN after Virginia, this becomes quite the challenge. But with it, it provides opportunities. The opportunities are what we're focusing on this summer.

It's what we've been talking to the authorizers about. It's what we're going to start talking to the appropriators about. You've already heard it signaled in Secretary Stackley's testimony. I did an interview with Megan Eckstein of USNI and she posted it



earlier this week and it really kind of lays out what we're trying to do.

If you look at that number one in FY '21 on the Virginia-class line, imagine me circling it with a laser pointer so it burns into your retina.

What I'm doing is I'm explaining why this number is so important. The reason it's so important is, if you think back to Chas's chart, it fills in one of those empty boxes in every single year that we have a trough. The ship authorized in 2021 will deliver in 2026 and hopefully, with the shipbuilder's *Drive to 55* we'll actually get it done in 2025. That's when the trough starts.

So it will be in commission. It will be in operation. It will be providing operational availability to the type commanders for the entire width of that trough, filling in one empty box on the bottom of each of those years.

So it's an incredibly important ship. The problem is, this one down here. The Ohio Replacement is authorized in this year and also, by the way, it's the last year of sequestration, the last year that the Budget Control Act is in effect. So it's a very challenging year for adding to the budget.

So what are we doing? Well, it's a two-pronged approach. The first thing that we're doing is we are working hard to squeeze every bit of cost that we can out of Virginia.

We're continuing to do what we've done before in design for affordability, in scrubbing the cost estimate, challenging assumptions, and saying can we make the per unit cost less? There's a certain benefit that you would have just by adding that 10th ship back to the block. And then when you couple that with other cost reduction efforts, you start to accrue some savings.

The second thing we're doing—and this is where the opportunity comes in—the opportunity of all of this work, plus aircraft carriers authorized every five years, really starts to give you the opportunity of innovative acquisition and procurement strategies that will save all of us money, but especially the government. No offense, but what I've been telling my team is, when you're building aircraft carriers, SSBNs, and SSNs all at the same time, someone is going to be smart enough to take advantage of that and

get your efficiencies, volume discounts, better pricing from the suppliers. Someone's going to get that advantage, and it better be the United States government participating in that advantage.

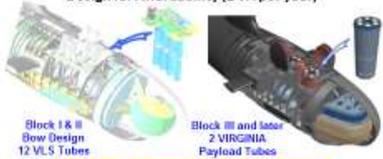
If we can do that, if we can couple cost savings on Block 5, the added benefit of adding that 10th ship back in for a per unit cost decrease, along with cross-class procurement savings, at the same time you're doing Ohio Replacement, we can get enough savings—and I'm not speaking numbers here yet—but we can get enough savings where it becomes so attractive that the incremental additional amount that you have to put into the budget for that second Virginia in 2021; it becomes so attractive that when combined with the value of that ship, because it fills in that one box every single year; it becomes an absolute clear understanding that that's the right thing to do. That's what we're working on this summer.

That's what Admiral Mulloy was talking about when he started talking about not so much the value of the national sea-based deterrence fund, but the value of the authorities that come along with it. So in the FY '16 NDAA they have already given us Economic Order Quantity procurement authority, Advance Construction authority, and Incremental Funding of specific components. We are going to go ask for more within the next budget cycle, the PB '18 budget cycle. We're going to ask for things like Continuous Production. Admiral Mulloy talked about that.

The missile tubes and the missile tube modules are a great example because of the profile for Ohio Replacement where you authorize one in '21, then you take two years off, then you get the second one, then you take a year off, and then you go one each year for the rest of the class. That saw-tooth is a challenge for industry to ramp up, both at the shipbuilders and at the vendors who are making the parts that go into the missile tubes. So if we can get continuous production authority and ramp up to a stable manning profile and reap the benefits of the learning curve as we go into that, then that accrues real savings. It does require some shifting of money earlier, bringing money outside of FYDP into the FYDP, so we're working with Chas and with Congress to

make sure that everyone understands the business case for that so that we can get that in next year's legislative proposals.

So, that's the main point of this slide, challenges and opportunities, a tremendous amount of increased work for the industrial base. With it brings the opportunity for cross-class procurement savings, innovative acquisition strategies, building stuff ahead of need that gives real return on investment for the money that you're putting into it. And it allows those savings adequately enough to where it becomes obviously the right thing to do to add that second submarine in 2021. And then that goes to addressing what Admiral Harris and General Breedlove have all been saying, that we don't have enough attack submarines and we need more.

VIRGINIA-Class The Right Submarine for Today with Flexibility for the Future 	
Blocks I & II (FY98-08) – SSNs 774 – 783 Increase in platform capability  10 Ships Delivered	Block III (FY09-13) – SSNs 784 – 791 Design for Affordability (2 VA per year)  Block I & II Bow Design 12 VLS Tubes Block III and later 2 VIRGINIA Payload Tables 8 Ships – 1 Delivered, 6 Under Construction
Block IV (FY14-18) – SSNs 792 – 801 RTOC enables increased A, per hull  10 Ships – 5 Under Construction, 5 Under Contract	Block V and later VPM – SSNs 802 and later Increases undersea influence effects  In Design Phase, FY19 Construction Start

NSA Corporate Benefactors 3/10/16 Distribution Statement A

Virginia-class. Where are we on this? We have kind of realized that we've fallen into a groove here with each contract block having a theme. So Blocks I and II were all about getting off the ground and getting into a production routine where we could start marching down the learning curve, getting the time required to build the submarines to be shorter, and then getting under-budget

delivery and holding it there. It was very successful as we reached the end of Block II.

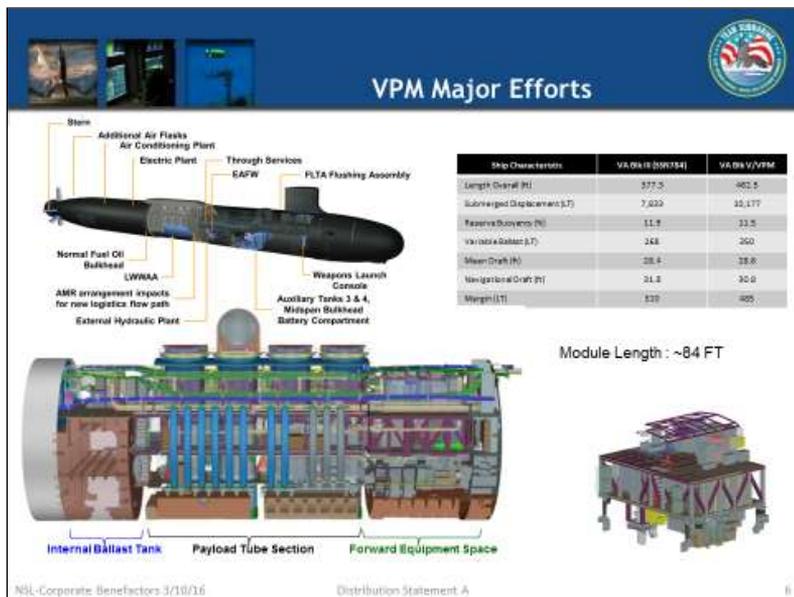
We moved into Block III. That was two for four in 12. One thing that I want to stress about this, we've talked about NORTH DAKOTA and her deployment already. NORTH DAKOTA is the first submarine of Block III, 784, the first one to have the large aperture bow array instead of the sonar sphere, the two Virginia Payload Tubes instead of 12 VLS cells. And she was fully certified for all Special Operations Forces: dry deck shelter, lock out trunk; and deployed prior to her PSA.

That's the one thing that we didn't talk about in all the discussion of REMUS 600s, Project 1319, first operational employment of UUV from a submarine in a tactical situation real-world mission for a combatant commander. And it was before that ship even went into PSA. So that is a real testament to the quality of the submarine that is being delivered from the yards. Again, it's ahead of schedule, under budget and in a condition where she could deploy to a real-world theater, work for a combatant commander and do great things, and then come back into PSA.

Block IV was the reduction of total ownership cost focus. That was where we said, we don't like the fact that our Virginia-class submarines are programmed to have four major depot-level availabilities during their life, and only available to do 14 deployments. So we want to reduce the number of availabilities down to three and increase the number of deployments from 14 up to 15. Those design changes have been approved and are complete and are laid into the contract for Block IV.

The first Block IV submarines won't come out for a couple of years, but when they do there will be more operational availability for the fleet commanders. That's important because as you go into this trough you have fewer than the 48 requirement—if that is still the requirement, it may very well be higher by then. So the submarines that you do have you want to be able to use them more than you can and not have to go into a depot level availability at the frequency that we do under the earlier classes in the first ships of this class.

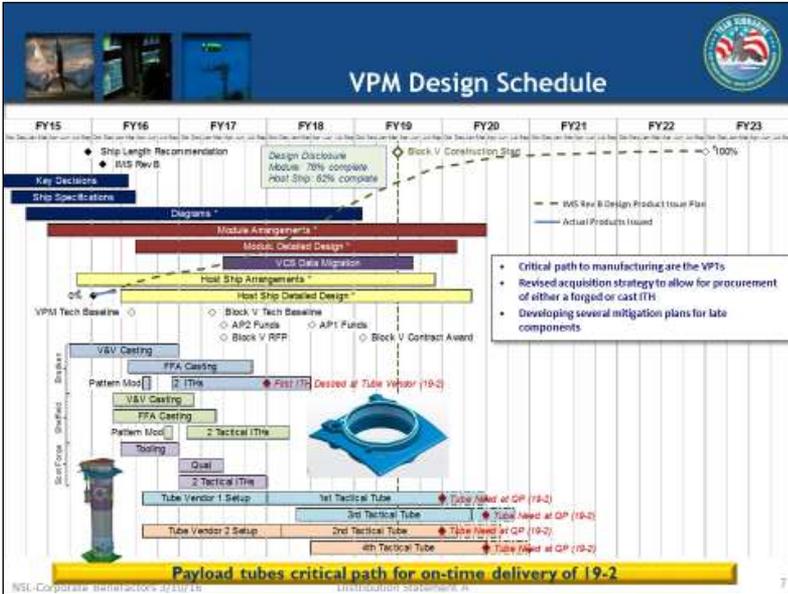
industrial base that is building the components for the missile tubes.



So where are we? We have all but one of the key decisions done. When we started to do the design we said okay, there are a number of things that we have to enshrine in granite before we can officially set ship's length with the insertion of the module.

All of those have been done with the exception of one. All the work is done. All the discussions are done. We're awaiting the final stroke of the pen from a briefing to a couple of four-stars that are very interested in it. This one is the one where we say okay, we understand that with the additional length to the Virginia the maneuvering characteristics will be affected. And we want to make sure that we understand how they're affected and what we can do to continue to operate in the way we operate attack submarines even with this additional 84 feet of hull in there.

We have done all of that work. We have built the case. We've explained it. Now we're just waiting for final approval. But once that's done, we'll be able to set ship's length and that will allow us to go off and start marching down the hierarchy of design products and be ready to go into construction when we get the advanced procurement and advanced construction authority in fiscal year '17 for that second ship in '19.



This is the VPM design schedule. It’s actually a live chart and we’re starting to march up the S curve. This is, of course, very high level. We have much more detailed metrics on design



products and we're starting to look at leading indicators to make sure we stay on track.

The other thing—and it's not real important that you can read all this, I can't even read all this because I don't have my glasses on—but we have three separate vendors that are working on prototyping the missile tube that goes into the integrated tube and hull combining to make the Virginia Payload Module. It's very similar to the way that we produce Ohio Replacement missile tubes in a quad-pack, except since these are all inline, you make two and then join the two two-packs together to make a four-tube missile Virginia Payload Module.

VPM Status

- Design in progress**
 - Full Diameter Design Concept located forward of Normal Fuel Oil (NFO) tank
 - 39 Key Decisions required to support setting module configuration/length
 - All have been received by the Program Office
 - 38 complete
 - EB labor commenced ramp up in June 2014 – from a combination of new-hires and completing programs (573 FTEs as of Jan 2016)
 - Revised MS capturing final module configuration received – Dec 2015
 - Ship Specifications – April 2016
- Next steps**
 - Design
 - Complete Key Decisions for length
 - Set ship specifications
 - Build – Prototyping - Integrated Tube Hull (ITH)
 - Factory First Article (FFA) – March 2016
 - Tactical pair – September 2016
 - Construction plan
 - Evaluate options to mitigate ITH delays
- PB17 reflects FY19 (Block V 19-2) construction start**
 - PB17 increases VPM total program quantities
 - SCN start in FY17 (AP and detailed design for VPM)

Reduce Schedule and Cost Risk – Early Prototyping and Mature Design at Construction Start

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This actually is a picture of the first prototype of the integrated tube and hull. This is the crown of the hull right here, and risers for what will become parts of the missile tube. The interesting thing here is the difference between casting and forging.

As we're doing both Virginia Payload Module and ORP at the same time, we're looking at the viability of both methods for constructing this significant component which is part of the

pressure hull. And again, this is challenges and opportunities. We're doing things on a scale that have not been done before and challenging some of the industrial base.

There is actually kind of an interesting side here. One of the vendors—and I won't name him—but one of the vendors found out that when you do this crown plate, after it is done there's a tendency of the corners to come back up a little. And so you have to use a cold press to regain the shape.

Their supplier, who they were using to do this cold press, when they went to do this, that was when they found that the press which had been installed decades ago, never was actually mounted to the base of the facility. It had the concrete pour around the feet, but all of the bolts that were supposed to be holding it down to the foundation were not there. And so when they went to press this corner back down, the press came up. That's the challenging part. The opportunity is, again, we're challenging the base, we're doing things on a scale that we haven't done before, and we need to figure out what's the best way to do it and trade those lessons between the two programs.

This is what I was talking about before, building individual tubes, joining them together in a two-pack. You've got the hull cylinders here. It goes into a part of the hull cylinder and then join those two pieces together for the Virginia Payload Module.

Acoustic Superiority (AS)

- CNO's undersea dominance mandate to pace the future threat
 - Projected to maintain undersea dominance through mid-century
 - First significant investments in VIRGINIA arrays or coatings since initial design
- Incorporates design changes in three areas
 - Large Vertical Array (LVA)
 - Enhanced hull treatment
 - Selected machinery improvements internal to hull
- Proved out on PCU SOUTH DAKOTA (SSN 790) via SOUTH DAKOTA Insertion Program (SDIP)
 - One year Post Shakedown Availability (PSA) in 2018
 - Demonstration at sea in 2019
- Forward fit - Block V and later hulls
- Back fit - Selected changes on VCS
- Propulsor
 - Planned to install on PCU SOUTH DAKOTA during new construction
 - If it performs well, it will stay on otherwise it can be removed during PSA

790 Key Events

Year	Event
2013	Construction Start Mar 2103
2017	Projected Delivery Nov 2017
2018	PSA Start March 2018
2018	Contractual Delivery Aug 2018
2019	PSA Completion Mar 2019
2019-2020	Test & Eval 2019-2020

US Navy Logo

Labels on Submarine Diagram: Enhanced Hull Treatment, Vertical Array, Machinery Quieting

Small text at bottom: NRI-Corporate Benefactors 3/10/16 Distribution Statement A

Acoustic superiority, we talked about this. The key here is we are going full speed. The SOUTH DAKOTA, SSN-790, is our test platform. We are also doing earlier, individual tests on other ships. The Large Vertical Array has already been installed and operated at-sea on DALLAS. It has been installed and operated at-sea on MARYLAND, albeit just during their sea trials coming out of overhaul. But now that they're done, we're going to be collecting a lot more data.

These installations are feeding the process of designing the software for processing the LVA. That's already done. It's included in APB '15. I've seen it in operation out in Manassas at Lockheed Martin. It's been in operation on the DALLAS and this is a phenomenal capability. This really brings a capability that we haven't had before. It exploits certain aspects of the acoustic environment and aspects of what we know about how threat submarines operate and what their vulnerabilities are. It really does help.

Now, we only put one panel each on DALLAS and MARYLAND, so it's not really tactically useful because you only have it on one side so it's kind of like a shopping cart with one stuck wheel. You have to keep going around in circles to keep it focused on what you're trying to listen to. But when we put both panels on SOUTH DAKOTA, she is going to be a fearsome character in the undersea domain.

In addition to the Large Vertical Array, we're also installing an enhanced coating. We have done the trade studies and selected the coating. We have a test patch going on the NORTH DAKOTA. The full coating will be going on the SOUTH DAKOTA in her PSA and we will then, of course, go and test it and make sure that we like what we're getting. For Ohio Replacement, we're reserving space and weight to install that coating as necessary, and then it will go on all the Virginias after this one.

Machinery improvements within the hull, this is attacking specific vulnerabilities. We've already done a lot of these as back-fits on our current Virginias. Again, amazing results just by changing the impeller on a hydraulic pump, significant acoustic results.

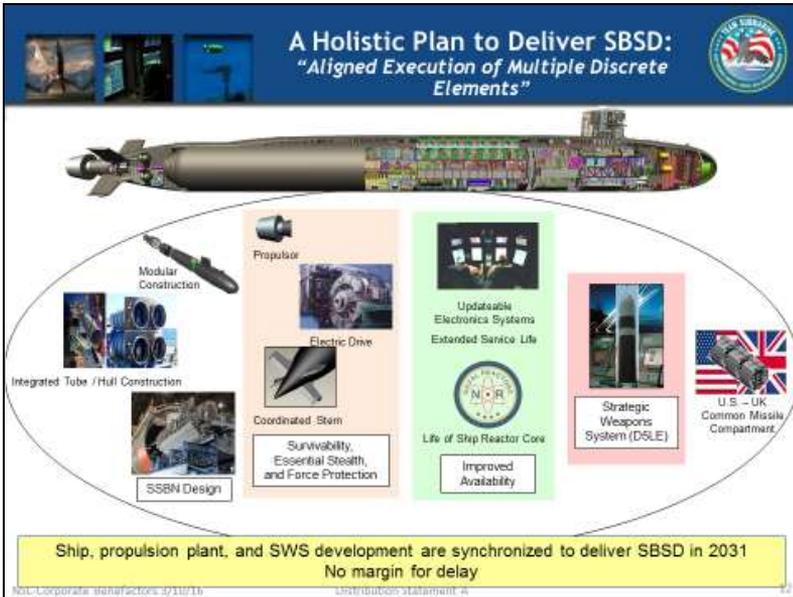
SOUTH DAKOTA (SSN 790) Insertion Program (SDIP) Key Events

- **LVA**
 - Concept Development - COMPLETE
 - LVA Specification - COMPLETE
 - Enhanced Hull Patch (EHP) and cabling installation - In Process (on 790 @ Quonset Point)
 - Preliminary Design Review - Complete
 - Critical Design Review - Aug 2016
- **Hull treatment**
 - Material Trade Study - COMPLETE
 - Treatment system design down-selected to "XHT-9"
 - Request for Quote (RFQ) from viable vendors
 - Patch test contract awarded to UTAS by EB
 - Preliminary Design Review - Complete
 - USS NORTH DAKOTA (SSN 784) Patch Test - Underway

WPI - Corporate Benefactors 3/10/16
Distribution Statement A

This is a little more detailed view of the Large Vertical Array, again, already installed on DALLAS and MARYLAND. It is already looking to be such an advanced capability that we're sitting down and saying okay, does it make sense to install this and then continue to have the lightweight wide aperture array? Or, should we just install multiple panels of this in place of the LWWAA?

And surprisingly enough, it's not a real significant cost difference, as far as we can tell at this point. We need to learn more as we actually get into the man-hours required to install it on SOUTH DAKOTA. And then as we complete the procurement of those arrays and bring the procurement cost down, we'll see if we can get it to make sense.



On to the Ohio Replacement Program. You've seen this slide before. I won't spend a whole lot of time on it, parallel lines of effort to include international cooperation with the UK. They all have to progress towards the finish line and get there with adequate margin.

One of the things Secretary Stackley keeps telling us is on this program—because as you've heard there is no margin left—if you think you're on schedule you're really behind. If you think you're behind, you're really in trouble. So he has been pounding into us the need to not only stay on schedule but to buy back margin into the program, to get ahead of schedule.

So we're working very hard with EB on the design. Newport News also has a factor in the design. We have come to an agreement on which shipbuilders will build which parts, and they'll share in the design of those parts that they're building. So we have got to get ahead of the curve in order to buy back margin and be able to account for the inevitable additional challenges that arise.





OHIO Replacement Accomplishments



ACCOMPLISHED

- Released Design Contract RFP (Jan 2016)
- In Process Review / Defense Acquisition Board with USD(AT&L) (Dec 2015)
- Gate 4 Technical Baseline Configuration Control (Nov 2015)
- Construction Group Established
- JROC Validated CDD (Aug 2015)
- Ship Control Concept of Operations Exercise (COOPEX) Phase 2 (Jul 2015)
- U.S./UK E Fixture Construction Contract Awarded (May 2015)
- Integrated Power System (IPS) Compatibility Test Facility (CTF) MILCON placed (May 2015)

ON-GOING & UPCOMING (FY16)

- Gate 5 (Jul 2016)
- Milestone B (Aug 2016)
- Generation 1 Propulsor Testing
- Construction of the OR Quad Pack Manufacturing Facility in Quonset, RI
- Manufacturing of U.S. and UK Missile Tubes
- Preparation for First Article Quad Pack Missile Compartment construction
- HM&E component prototyping (Diesel Generator, Air Conditioning Plant, Reverse Osmosis Unit, Light Emitting Diode (LED) Lighting, Advanced CO2 Removal Unit)

Manufacturing Fixtures



First Article Quad Pack (FAQP)



OR Quad Pack Manufacturing Facility



NSL-Corporate Briefings 3/10/16
Distribution Statement A
13

So where are we on this? The biggest thing is that this facility in Quonset Point is now built and christened. Fixtures from APCO and Sweden have been contracted for and are starting to arrive and be put in place. We will be ready to start fabrication of hull cylinders later this year.

This is an incredible event because again, you say we're going to start building the first hull in 2021. Well yes, you're right, but with RDT&E and prototyping certain parts of the submarine, we're bending metal already. Once the fixtures are fully installed and tested and certified, we're going to start building that first common missile compartment and it'll be a glorious thing.



Technology Development

System and Component Re-use

VIRGINIA Class







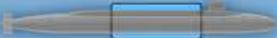




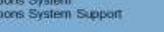





OHIO Class










Engineering Integration / New Development

OHIO Replacement Class
















Philosophy of re-use minimizes the need for developmental effort for the OR delivering required capability at the least cost.

NSA-Corporate Benefactors 3/10/16
Distribution Statement A
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Technology development. Again the focus or the philosophy of Ohio Replacement was, as much as possible pull through from Virginia things that weren't going to change on this that could either be absolutely brought forward with no changes at all, or scaled or adapted for use on Ohio Replacement. What that does is it significantly whittles down the things that you have to actually go and do technology development on. We have a technology readiness review that is required by progress towards milestones. Out of all the technologies looking at what was the TRL, what was the impact to the ship, there really ended up only being two technologies that meet the level for advanced oversight by the Navy and OSD.

One of them is the advanced carbon removal unit and the other is a classified system that I can't really talk about. But to talk about building a ship this large with state of the art technology, and being so far ahead on most of it that you really only have two specific instances that require that additional oversight, that's a comforting factor. But again, it can't let us rest easy.



Program Challenges

- **Maintaining Schedule**
 - Design ready for construction start (83%)
 - Construction start in 2021
 - Deploy on schedule (2031 IOC)

- **Transition from Design to Shipbuilding**
 - Collaboration of builders, maintainers, operators, in the design process
 - Achieve 83% design complete at construction start, enables Manufacturing Assembly Plan (MAP) detailed planning
 - Utilizing proven technologies and test facilities to mitigate lead ship risk
 - Established Integrated Master Schedule (IMS); execution performance consistently evaluated
 - Experienced Government and Contractor technical and programmatic leadership in key positions

- **Achieving Affordability**
 - Aggressive actions to achieve all cost targets
 - Continuous measurement of progress
 - Challenge industrial base

NSI-Corporate-Benefactors 3/10/16 Distribution Statement A 15

Program challenges, and this is my final slide. This program challenge is specific to Ohio Replacement. But really, because of the primacy of the importance of that program, both to the PEO and to the Navy and to the nation, you can easily expand it into the challenges for the PEO.

Again, I take you back to the challenges and opportunities. The incredible amount of work that the industrial base and the Navy is embarking on over the next couple of decades really does tax what we have in-place. The challenges it brings in terms of ramping up the manning, ramping up the industrial facilities, being able to progress through each of these individual programs to success, that can't be underestimated.

And we're not underestimating them. But in addition to looking at them as challenges that you have to work through, you have your shoulder on the blocking sled, you can't let it stop moving. Once it stops, then you've got to get breakaway torque again and that's really hard. So keeping that blocking sled moving down the field while at the same time looking at the opportunities that they bring.

That is really what the business and financial management side of the PEO is working on this summer, building that case to Congress such that when you combine the savings that we're going to scrub on Virginia, the savings that you would get anyway by adding a 10th ship to Block V, and the savings that you can get with acquisition authorities on Ohio Replacement by combining this work under one umbrella, that combined amount of savings becomes so attractive when applied to that 10th ship that the relatively incrementally small amount of money that the Navy would have to add to the budget, it becomes an obvious decision. You know the value of that ship. Out of those 51 SSN years in the trough it retires 17 of them just by authorizing that one ship.

So that's where the dog comes from the bumper and climbs into the car. Once the dog is in the car and riding pretty, having had that second ship in 2021, then we'll come out of the BCA, like Joe Mulloy said, figure out where we're going with the Navy and the nation as a whole, and then we'll start looking at the other ones in the Virginia-class in the out-years. If the requirement has gone from 48 to something higher, every single time we're only building one Virginia-class submarine it will become a debate and an argument about why it's a good idea to add that second one in. Right now we're just focused on 2021 and there's a lot of additional work that would have to be made to do that in series down the road, but it's clear that that is a potential of where we're headed here.

So in closing, challenges and opportunities, and we're here ready to work with you on both. John, do we have time for questions?

ADM. SCOTT VANBUSKIRK: Mike, earlier I asked a question about availability. It seems to me that the picture looks pretty good of what we're fighting for on the construction side of the house and procurement side of the house. But the availability I was really getting to was the maintenance availability of our ships. It seems to me it's great if you have 41 but if your availability isn't there, we're going to be screwed.

And I will tell you—this is more of an observation watching my brother Al Konetzni work in the maintenance world, but it seems like there's a lot of A sub O sub C, and by C I mean contracting in terms of delivering of contracts on-time to be able to do availabilities, or to be able to do procurement. And just by going after that A sub O, I will tell you, you can gain availability, and I'll give you an example. Joe wanted an example.

But I would say for the last three contracts that our company has gotten the period of performance started before the contract was awarded. I think that's what a lot of us see, that the efficiency of what we could have there would be much greater just getting out contracts that we know could be coming out. So I think you all can go back – my point is to go back and look, how are we delivering contracts?

And you can get back some availability back into the program along a lot of different lines, whether that's LDUUV undersea stuff or really in the maintenance world. So that's my, kind of, observation in here. We can't cloud the issue a little bit with what we're getting in construction. We've got to look at where that A sub O is in our contracting world.

ADM. JABALEY: Thanks, Admiral VanBuskirk. And I'll tell you, I agree with you. Contracting is a sore spot almost everywhere, and you really have to look at it in multiple ways. For instance, number one, within the PEO, NAVSEA O2, does our contracting and it is a constant fight to refine priorities and assess which one really needs to get done. They all need to get done, but what's the dog closest to the sled, because they are undermanned. When you look at the continued attacks on GS manning within the Navy, within the Department of Defense, within the government, it's not going to get better.

A second problem that we have is that NAVSEA does such a good job of training our contract specialists that when they finish their training pipeline they become immediate targets for other places in federal government contracting work. So there is somewhat of a throughput that hurts SEA-O2's ability to stay on top of contracts.

We did some very hard work last year. When I was SEA-07, deputy commander for undersea warfare, one of the things that we did to help maintenance performance is we took three availabilities and contracted them out to the private sector. So the Montpellier, the Columbus and the Helena all were taken out of public shipyards to prevent from happening to them what had happened to Connecticut and Albany, frankly, where they're sitting in a public shipyard behind an SSBN, behind an aircraft carrier, and just languishing. So we took those three availabilities out and competed two of them and sole source awarded one of them.

I think that if you asked EB and Newport News they'd tell you that we did a pretty good job of getting them the work package and the contracting process far enough in advance that they would be able to perform at the level that we're asking them to perform to on completing those availabilities. And those availabilities are in '16 and '17 and one of them goes out into '18, so we'll see how those go.

The final part is for contracting specific parts, specific maintenance tasks within a bigger availability like the shipyards do with OII, again now another arena of contracting, another set of challenges. We recognize the problem exists. We continue to work on it. I'll go back and talk to Moises Del Toro and Mark Whitney and say that we still have problems out there matching period of performance with our ability to award a contract, so that you're already behind the eight ball when you start. We'll try to get better, but it's a good point.

ADM. VAN BUSKIRK: I was asked to redirect, but really it's about the demand signals that you and other Navy leaders and DOD leaders have issued to industry to be more aggressive in pursuing innovation and to have more skin in the game in their own independent R&D efforts. No doubt you've sent similar signals to your labs. My question really is, how can we best work together when the labs have the leading role in a new project or developing a new capability and we want to leverage industry's commitment and capability as well?

ADM. JABALEY: Again a good question. I will tell you that the key is communications. Too often we are either actually hamstrung by what we can say due to contractual reasons and legal reasons, or we think we're hamstrung by what we can actually say. Specific to the LDUUV issue that you brought up earlier, I'll tell you what I know.

First of all, LDUUV is not under PEO SUBS, it's under PEO LCS. PEO LCS used to be PEO LMW, Littoral and Mine Warfare. So at that point it made sense to assign it to it. When we reorganized that PEO into LCS the thought was LDUUV would certainly be employed from LCS at some point so we'll leave it there in LCS. So that's where it is.

Will it stay there? I don't know. I will tell you that with the independent review team that Admiral Johnson led, and the changes which they are now directing, and considering additional changes within the LDUUV program, part of that discussion is also as it approaches Milestone B, who will be the resource sponsor for that and for other program of record UUVs as they come into being?

We're in somewhat of a period of churn right now because within the last year we have stood up DASN Unmanned on the SECNAV staff. We have stood up OPNAV N99 as a resource sponsor for unmanned systems pre-Milestone B. All of that is kind of being digested by the system.

As that kind of grows and blossoms and we start transitioning programs to ultimate resource sponsors, there will be discussions about how much of the PMS 406, which is the program office that runs LDUUV and some other UUVs, what happens to that portfolio? So I can't tell you where it will end up. I have some thoughts on where it should end up, and we'll see what happens. But those discussions are going on from the resource sponsor aspect of it and within the acquisition structure aspect of it.

So coming back to the point of communications, when the direction was given to restructure the LDUUV program, I sat down with Brian Antonio and said one of the things we have to do is put out a clear comms strategy so industry knows where we're headed. We can't do that until we know where we're headed, so

this is where it's hard. Brian's got challenges in this, not the least of which is that his real job is fighting for LCS and figuring out how LCS becomes a frigate, and how many are we going to build and how is he going to deal with the operational issues that they've had?

So it becomes somewhat of a bandwidth issue, which is not a satisfactory answer, I know, but all I can tell you is keep asking. As we come through changes in the alignment, in the structure, we'll hopefully be able to communicate those clearly to industry so you can understand where we're headed and support it in the way that works for you. I hope that was helpful.

ADM. VANBUSKIRK: Thank you, I appreciate it. Yes, sir.

ADM. JABALEY: It didn't feel helpful from here.

IN MEMORIAM:

CDR Robert T. Bridges, USN, Ret.
RADM Jeffrey C. Metzler, Jr., USN, Ret.
CAPT Colin H. Saari, USN, Ret.
CAPT Kent Rodney Sigel, USN, Ret.
RADM Paul D. Tomb, USN, Ret.
EM2(SS) Robert E. Wilton, USN, Ret.



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34th ANNUAL SYMPOSIUM
OCTOBER 26-27, 2016

GATEWAY MARRIOTT
CRYSTAL CITY
ARLINGTON, VA
(new location)

**NAVAL SUBMARINE LEAGUE
2016 CORPORATE MEMBER RECOGNITION DAYS**

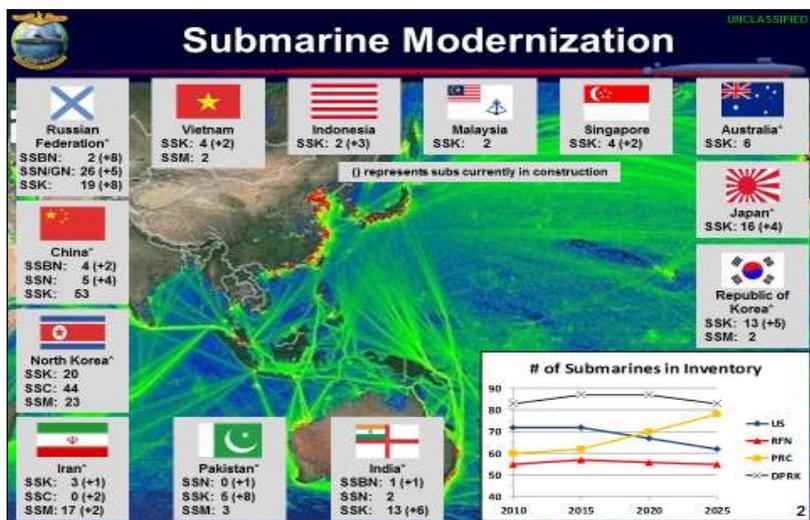
**REAR ADMIRAL FRITZ ROEGGE, USN
COMMANDER, SUBMARINE FORCE, PACIFIC**

March 10, 2016

Good morning, everybody. I'm delighted to be here. Everybody I encounter asks me how things are going, how I'm enjoying the job. And, of course, I have to point out that's a completely rhetorical question. I am SUBPAC, so life is pretty good. The job is great. I'm delighted to be here and bring along some tropical breezes to the Washington, D.C. area, and most importantly a spirit of warm aloha.

I'd like to spend just a little bit of time today telling you a little bit about—kind of expand on what my predecessors have already been talking about in terms of what's going on in the world, certainly a Pacific sort of focus, but I'm going to take the liberty of speaking a little bit more broadly, and some of the things we're doing in response to all that.





As has been talked about, we're doing a lot of things within the U.S. Navy with Virginia-class, with VPM, with Ohio modernizations, with Ohio Replacement, that are going to make our platforms more capable. That's really important because the rest of the world is doing things that make their Submarine Forces more capable. So just around my AOR what you see is all the different nations that are operating submarines, that are building submarines, and down there in the lower right-hand corner is what that means in terms of the inventory.

As my predecessors have talked about here, we're on a path where we're going to have a trough in our own numbers. We're going to have to make sure that the numbers that we have are the most capable submarines we can possibly put out to sea because we have important work to do and more demands than we can possibly meet. The yellow curve on there obviously shows some of what China is doing, both with respect to capacity and capability. Even the Russian curve on there, although relatively flat, I need to emphasize that really reflects the replacement of old and relatively less capable platforms with brand new very modern ones.

Obviously, Theater ASW is a team sport, so a number of the nations that I picture on here are, in fact, our teammates, our partners, our friends, our allies. So it's not us going alone, but there's no question they look to us for leadership and we set the standard in terms of not just the TTPs but in the capabilities we're bringing to bear.

The last thing I'd point out, and it doesn't show up on the slide very well, but for a number of those countries there's a little asterisk, and that's countries that actually have an indigenous submarine manufacturing capability. It used to be that most of the rest-of-the-world Submarine Forces were comprised of submarines that had been exported by primarily one or two near-peer competitors. But everybody around the world has recognized the value of submarines, of submarine capabilities, and for their own national security interests are interested in having that as an indigenous capability. So almost everybody on there is in various stages of developing an indigenous submarine building capability.



Let me tell you a little bit about some of those capabilities. Obviously I'm just featuring a couple of nations here in particular, but Russia recently has taken possession of and is now operating its new SSGN, the Severodvinsk. Out in the Pacific we just have seen Petropavlovsk receive its first Dolgorukiy.

China is heading to sea with not just a new SSBN, the Jin, but nuclear attack submarines, the SHANG I and SHANG II, under production. Submarine capabilities are enhanced by things such as what you see in the lower left. Russia recently has not only deployed, but they are employing new cruise missile systems, submarine-launched and surface ship-launched, capable of both anti-ship and land attack mission. And as was mentioned earlier today, North Korea is also seeing the advantage of having a deterrent that can be put to sea, and they are pursuing that right now under their Goraе program.



Let's talk a little bit more about Russia. Their military budget has doubled in the last decade. Most of that is going to their Submarine Force. Again, they recognize the value of assets that can go to sea and try to remain stealthy.

The red range rings you see there are the ones that highlight the potential threat that is posed by this new weapons system, the Kalibr, which they are now putting out to sea. The larger ring is the land attack cruise missile range, and the smaller shaded in ring is the anti-ship version. And conveniently, I put those circles across some of our fleet concentration centers, just to give you some sense of what they hope to be able to hold at-risk.

The other thing I point out in the lower right, and having to do with their resurgence is not only their capability but their intent, or their demonstrated actions. So what you see in the lower right, 10 years ago, or even 20 years ago, would have looked like a Tomahawk cruise missile being vertically launched from a DDG into Desert Storm, Iraqi Freedom, Enduring Freedom, etcetera. But that is a vertical launch land-attack cruise missile of the Kalibr system being launched from a Russian platform into Syria. So



again, they are not being at all shy in demonstrating and using the capabilities they have.

The other thing I want to point out on this slide is really the tag line at the bottom. As the Russians go about modernizing their forces, and you can see that progression across the top as they go and ultimately replace Oscar IIs with Sevrodvinsk and replace Deltas with Dolgorukiys. These are very, very quiet platforms, manned by very capable submariners, and heading off into really, really big oceans. One of the things that we realize every time that there's activity out there that we're interested in, is that when adversaries have very, very quiet platforms heading out into a really, really big ocean, it's really, really important for us to be postured, be positioned, to be able to try and have some awareness of what's going on from the moment they get underway. Once they disappear out into the broad ocean expanses, it's a very, very difficult problem.

And if the combatant commanders, if the National Command Authority, gives us the Navy, us the Submarine Force, the task of finding those folks and holding them at-risk, if we haven't really begun that on day one of their strategic deterrent patrol or their forward deployed operation, then it's going to take a lot of time and a lot of assets and a lot of resources for us to be able to do what the National Command Authority is asking for. So it's a pretty big challenge.



Arctic

UNCLASSIFIED

Russia Fortifying Bases in Arctic Region

● Key regional headquarters
 ● Confirmed bases Russia is building/operating
 ● Bases Russia may upgrade



Receding summer ice has renewed interest in maritime shipping and natural resources in the Arctic



USS SEAWOLF at North Pole
30 July 2016

Renewed global interest, but our Submarine Force never left 5

One of the other areas in which Russia is being very active right now is up in the Arctic. I'm going to spend a little bit of time here talking more deeply about the Arctic. Why? Well, obviously, global warming and the melting of the ice cap is creating the potential for not only commercially viable transit routes, but commercially viable resources.

The Arctic, although the smallest of the world's oceans, is assessed to have—even just within the U.S.-claimed Arctic—a trillion dollars' worth of hydrocarbon resources. It's assessed that throughout the Arctic basin as a whole, about 30 percent of the world's undiscovered natural gas, 15 percent of the world's undiscovered oil resource reserves, and 20 percent of liquid natural gas, are all within the Arctic. So there's obviously commercial and economic interests.

There's a desire for resources. Fishing stocks have the potential to become more accessible and more affordable. Maybe soon we will even have Arctic tourism. Additionally, the Arctic is warming relatively faster than the rest of the planet; about twice as



fast. So this is a phenomenon which we are not only monitoring but we're anticipating and trying to get out ahead of.

Right now it's estimated that on average you get relatively ice free conditions going through the Bering Strait for about 20 weeks out of the year. Over the next couple of decades, it will probably increase by about 20 percent—that's almost 30 weeks out of the year. That northern sea route that you see shown there currently is ice free on average about two weeks out of the year. Over the next couple of decades that should quadruple, to an estimated about nine or ten weeks out of the year.

So that explains why people are interested, including the United States. Russia, you see with those little colored dots there, is busily reactivating military facilities that previously had been deactivated at the end of the Cold War, some that have been inactive for decades. And they're adding additional facilities as well. They've created a new strategic military command responsible for the Russian Arctic. They're adding a couple of brigades of marines up in that area as well. That, on top of all the other investment, including the modernization of their northern fleet, which remains their largest fleet.

But of course it's not only the Russians. In fact, I'll hold that thought here for a moment.

ICEX History UNCLASSIFIED

1940s: Diesel Submarines

1958: NAUTILUS crosses 90° North

1959: First surfacing

1960s & 70s: Regular ICEXs

1980s: ICEX goes International

1990s: SCIEX

Today: A Unique Capability 6

The United States, of course, has some of those same interests. We have a long history of interest in the Arctic, not just in the nation and not just in the Navy, but particularly in the submarine force, going back to the first challenging explorations in the '40s and then some seminal events there with nuclear power.



UNCLASSIFIED

National, DoD and Navy Arctic Objectives

National

- Evolve Arctic Infrastructure and Capabilities
- Enhance Arctic Domain Awareness
- Preserve Arctic Region Freedom of the Seas
- Scientific research/Traditional Knowledge
- Strengthen International Cooperation

Defense

- Promote Defense Cooperation
- Prepare for a Wide Range of Challenges and Contingencies

Navy

- Ensure Arctic Sovereignty and Provide Homeland Defense
- Provide Ready Naval Forces
- Preserve Freedom of the Seas
- Promote Partnerships within the U.S. Government and with International Allies

Roadmap Action Item (2014-2020)

- Increase Training Participation and Visibility During Arctic Exercises (eg. ICEX)

Strategic Direction for Greater Collaboration in the Arctic 7

As a result, just within the last couple of years now, the nation, the department and the Navy have all issued new Arctic roadmaps, new Arctic strategies, which you see summarized here. The thing that I want to emphasize here is that when you look at the Navy document just signed out within the last couple of years, it lists the responsibilities for the Navy in the Arctic; and those are no different than Navy responsibilities anywhere else around the world. It's a recognition, though, that executing those responsibilities in the Arctic has some unique challenges just because of the very, very harsh environment.

For the near term the good news is that we think that we can execute those responsibilities with the force in being. It doesn't require additional capabilities. It doesn't require additional capacity. But as we look forward and as this roadmap looks out to the future over the next couple of decades, this will be an area where—if warming and ice melting continues—this is going to be an area where it's going to require more capability and more capacity in order to execute these very same responsibilities.

Fortunately, though, the Navy and Submarine Force are well positioned for this. We have a lot of experience. In fact, how many folks here in the room have Arctic experience? Okay, that's even more than I thought. We've been operating up here a lot.

ICEX-16 Overview UNCLASSIFIED

Location: Beaufort Sea

Key Dates

- Site selection/camp construction: Feb/Mar
- Ice camp operations: 7-31 March
- Submarine Tracking Range: 12 – 27 March

Participants

- Over 200 participants over 3 weeks of ops
- 2 SSNs present for ~2 weeks
- Over 35 Organizations
- 4 Services: USN, USCG, USA, ANG
- 4 Federal Agencies: DoD, DoI, DHS, DoS
- 3 Allied Nations: UK, Canada, Norway
- Academia: Naval Post Graduate School, MIT, University of Washington-APL
- Select media organizations

Ice Camp Sargo – commemorates first winter transit of Bering Strait

- Submarine centric footprint repurposed for an expanded ICEX vision
- Balancing warfighting, scientific and strategic engagement objectives
- Environmental compliance/Zero discharge camp (Greywater EPA permit)

Ice Camp SARGO

173 nm

Beaufort Sea

Deadhorse/Prudhoe Bay

ALASKA

8

We've been doing this through a variety of things, but in particular one of the things that we've been doing for a number of decades is the ice exercise, or ICEX. This is a year where we have an ICEX scheduled. Through the leadership of N97 and SUBFOR, we're on a biennial cycle now for our ICEXs. In fact, you'll notice from those dates that some of us are going to be privileged to head up for the ice camp this year. We're leaving pretty soon. In fact, when I leave here it's to go start packing my bags.

I'm going to spend a little bit of time talking about where we've gone with ICEXs and what we're hoping to get out of this one. We do have now an ice camp set up. It's almost 200 miles north of Alaska. It was kind of interesting to observe the process that goes into just figuring out where you're going to set up an ice camp. There's a few things that you really have to have.

You have to be far enough north that it's cold enough that hopefully the ice is going to stay stable. You have to be close enough to be able to range with aircraft, and you don't want to assume that it's a one-way trip—that you're going to be able to refuel once you get there. So that kind of limits the range a little bit.

The ice moves, so we set up the camps in places that hopefully are going to remain in international waters or in U.S. territorial waters. You need kind of the right mix of ice, too. You really want to set up your camp on places where you hope the ice doesn't break apart. That's the really rugged, multi-year ice. But because it's really rugged stuff, it's difficult to land a plane on, so you also want to have nearby some first year ice as well, which is a little easier to groom.

So the team spent most of the last few weeks looking at a variety of sources. They picked a site, this site right here. As of this morning there are 50 personnel from a variety of organizations who are living on the ice. As you can see on the schedule there, we've got more things coming.

One of the challenges from CNO Greenert back at the 2014 ICEX was to recognize this isn't just about the Navy, this is a national priority and we need to find ways to be more collaborative. So you can see—I won't read the statistics to you, but in addition to the Submarine Force presence and Submarine Force objectives with a couple of SSNs, tactical development, UUVs, etcetera, we've got multiple services, multiple agencies, multiple nations, academia, and there's going to be a good bit of media associated with this as well.

So, why Ice Camp Sargo? Well, it commemorates the first-ever submarine wintertime transit of the Bering Strait by USS SARGO under the command of Lieutenant Commander Nicholson. Vice Admiral Nicholson, of course, Submarine League members will remember, was here on this very stage last fall being recognized with a lifetime achievement award. I was proud to be in the room to participate in that applause for Admiral Nicholson.

There are a lot of things that we've learned, lessons we've learned over the years that are going into trying to improve the

quality of our data take and improve the quality of the experience, and always in keeping with environmental regulations. So this will be the first ice camp where we've obtained EPA permission for any discharges, and the expectation that we've put upon ourselves is for a 100 percent backhaul. Everything we bring up we're going to bring back, and literally leave the camp site cleaner than when we found it.

Strategic Objectives

Submarine Force Readiness

- Assured access and combat credibility by sustaining submarine readiness in the Arctic
- Validate Arctic specific training, tactics and procedures

Arctic Engagement

- Enhance coordination of national efforts in the Arctic and to support the U.S. Chairmanship of the Arctic Council's coordination of national efforts in the Arctic
- Support U.S. military and allied Arctic training requirements
- Educate key decision makers on the Navy's role in the Arctic

Arctic Domain Awareness & Outreach

- Continue scientific research and data collection to enhance knowledge of the Arctic domain
- Grow the involvement of regional partners in the ICEX
- Media coverage of SSN presence supports strategic messaging of USN Arctic commitment

Arctic Test & Evaluation

- Provide a venue for test and evaluation of UUVs / UAVs in the Arctic environment
- Evaluate new camp infrastructure
- Environmental Stewardship and execute a zero or near zero camp discharge model

ICEX 2016 - Visible Demonstration of U.S. Involvement in the Arctic

These are the strategic objectives. Again, I'm not going to read it all to you, but I hope you'll see that it's a combination of things that benefit Submarine Force readiness through tactical development and also through having additional submarine crews and submarines experience with an understanding of what is unique about operating in the Arctic.

I got to do the OP-EVAL for the Seawolf-class on USS CONNECTICUT. Despite the best modeling and analysis and engineering, what you always discover with any brand new design is that things operate a little differently when the water is less than

32 degrees than it is at say 33, 34 or 35. So I'm sure there's going to be a lot of learning conducted.

A lot of engagement opportunities. It was mentioned earlier that the Arctic Council is having meetings as we speak in Fairbanks, Alaska. So there's going to be an opportunity for the U.S. delegation to the Arctic Council to participate and go visit the ice camp. There's going to be some media. We're looking forward to a great experience and some great results.



My segue here might not be obvious when you look at the title of this slide, but this is about going back to what is going on in the environment, what's changing and what we're doing about it. I'm shifting now over to China. But the reason I segued over here to this slide is to look at that red arc that goes up into the upper right-hand corner of the slide. The Chinese navy, not only their Submarine Force, is developing capabilities, developing capacity, and they're doing what I think any emerging naval power would aspire to do. They are trying to expand their areas of operations and trying to secure their lines of communication.

So that red arc going into the upper right-hand corner of your slide shows last year a three ship surface action group of the PLAN went up into the Bering Sea, exercising the right of innocent passage which allows you to pass within 12 nautical miles of another nation's territory. In this case it was U.S. territory of Alaska—all innocent passage, all peaceful, but that's unprecedented activity. Similarly, a lot of what else you see in this slide is an unprecedented level of activity. Again, not surprising given that they're an emerging power.

If you look over to the right side of that slide you'll see that in 2014 China for the first time ever participated in our Rim of the Pacific exercise, RIMPAC. In 2016 they plan to participate again with three ships, three ships among the 47 ships, and China among the 27 nations that are going to be participating in what's going to be, once again, the largest RIMPAC in history. Every year we make that claim because every year it keeps growing.

You see as well over there to the left that yellow line shows that they've been expanding their operations into the Indian Ocean, and not just expanding their operations but again attempting to put in place the kind of Mahanian coaling station theory of getting logistics and resupply and repair kind of facilities through agreements with other nations. So you see highlighted here a port facility in Sri Lanka, a pending agreement in Djibouti, a pending agreement in Karachi as well. In their own writing China describes this as trying to establish a maritime Silk Road or a *string of pearls*. They recognize that their national security and the security of the party depends upon economic development, and that economic development depends on those secure lines of communication.

So they've been investing heavily in this area, an 85 percent stake in ownership of that port facility in Colombo, Sri Lanka; about 25 percent in Djibouti. But, of course, the China Overseas Shipping Company has large investments in overseas ports from Antwerp and the Suez and Singapore to Seattle and Long Beach. So, they are very aggressive.

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Expanding PRC Submarine Operations

YUAN deployment included stop in Karachi, Pakistan.

ONG deployment included stop in Colombo, Sri Lanka.

SHANG deployed to Indian Ocean.

PRC Defensive Layers

Demonstrated endurance

- 2014 SONG IO deployment
- 2014 SHANG IO deployment
- 2015 YUAN IO deployment
- Months long deployments similar to our SSN

New missions and areas

- Establishing sea-based deterrence
- Indian Ocean patrols

Influencing region

- Ship visits in conjunction with port investment and military sales

Continuous, Farther, and Longer Operations

11

Their Submarine Force is similarly aggressive. Obviously, here I won't talk about any specific operations, but they're out and about and they are building. Not only are they building new submarines, but they are exporting. Pakistan is a customer. Thailand is rumored to be becoming a customer. Again, you can kind of see that they are also using their submarines for their own version of theater security cooperation, with stops as you see highlighted here in Karachi and in Sri Lanka.



In talking about China, I've referenced both capability and capacity. They are learning and developing and maturing technology, and building more capable platforms. They have a shipbuilding industry that allows the generation of an awful lot of capacity as well. I wouldn't presume to compare the quality of workmanship that goes into a JIANGKAI with what goes into anything coming out of any of our U.S. shipyards, but the fact is that quantity has a quality all of its own. The point here is that on any given day it's entirely likely that the U.S. assets under the command of the U.S. 7th Fleet are going to be outnumbered numerically, again not qualitatively, in their backyard.

UNCLASSIFIED

Expanding DPRK Capabilities

DPRK is developing SLBM technology



- On 09 May 2015 DPRK announced a successful SLBM launch
- Most likely an ejection test from a launch barge or experimental, single-tube submarine



**22 AUG 2015
~ 50 submarines sortied
in a 24 hour period**



Insight into capability and intent remains a challenge

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North Korea we've talked about a couple of times. Again, I want to point out that they are seeking to expand both capability and capacity. We've talked about their SSB, the Goraе, which has been in and out of port. And they've been doing a number of tests on a potential submarine-launched ballistic missile that could come out of the Goraе at some point. In the upper left you see that they claim to have successfully tested it, and as one of the earlier speakers alluded to, my teenagers would look at that as a bad job of photo-shopping, but that at least is what they claim.

But again, they obviously feel like they need to be ready to defend themselves. What was interesting is just last August, you see in the upper right hand corner, during yet another round of heightened tensions between North and South, they were actually able to sortie 50 submarines in about 24 hours and get them out of port. That's pretty surprising. Now I have no idea whether 50 actually returned to port.

And although they're submarines, I have no indication that any one of them actually ever submerged. But they were able to get them out of port.



I do live in an interesting neighborhood out in the Pacific. We've talked about this a little bit. The yellow there highlights the AIS, the Automated Identification System tracks of merchant shipping. It speaks to the importance of the South China Sea and the world economy. That's where all the traffic goes.

The South China Sea is also very resource rich. So in addition to a national security perspective to commerce there's an economic security consideration that makes that an area with a lot of competition, a lot of potential friction.

What you see highlighted there on the right is kind of the difference in just a handful of months between the natural reef of Fiery Cross and what it has recently looked like. You've all been able to read in the newspapers how this work continues and is now getting to the point of actually putting capabilities onto those reefs. And although our press, actually even many of our leaders both in uniform and out of uniform, describe this activity as land reclamation, I would offer that that is an overly generous characterization that does not benefit the international community and does benefit the Chinese.

This is reef destruction, which is resulting in land creation where land, at least under legal definitions, never existed before. So again, I would suggest that in our dialogue on this we call it for what it is. There are estimates of significant negative impacts to the fisheries in the South China Sea, which all those littoral nations also compete for. So now we're taking a scarce resource, making it even more scarce and increasing competition at a time when nations are becoming increasingly militarized in seeking to enhance their claims.

A last point I would make, and sort of the point of that inset down at the bottom, is that China is not alone in trying to bolster their claims. Many of the other littoral nations who have competing claims have occupied reefs, have built some sort of facilities and have tried to add to their territory, but certainly not of the magnitude that we see from China.

Pacing the Digital/Cyber Age UNCLASSIFIED

Vital Networks Increasingly Connected

Complex Electro-Magnetic Environment

Frequency spectrum is getting full

- Commercial industry already addressing
- Spread Spectrum / Frequency Modulation

Solid State RADAR Transmitters

- Commercially available - financially competitive
- Improved return recognition
- Low power -> Signal strength meaningless

30,000 Watt Radar

250 Watt Radar

R&D / Acquisition / Modernization Process Must be Nimble 15

There's been a lot of discussion about electronic maneuver warfare. This is an area where I think our industry partners can be of great assistance to us. There are two things I want to highlight

here. First, on the right, the normal progression of technology, not even for military purposes but for commercial purposes, such as a surface search radar.

As we get to digital solid state radars what we find is that just as it has a tremendous capability for every bass fisherman, it has a tremendous capability for everybody who might be out wanting to look for a periscope. So we need systems that can keep pace. And what you see in the lower right is the result—that small low-powered digital radar has a better defined return off of that target than the much more high-powered analog radar that would be very easily detected by signal strength on our ESM suites.

The left-hand side, talks about cyber. Keep in mind, the very first Virginia-class went to sea with more computing power than the aggregation of every submarine that we had ever built before it. That is a great, great strategic and tactical advantage for us, but it creates a potential vulnerability as well. We will always want to try to pay attention to our defense, to keep people out of the networks, but I think it's going to be equally important for us to try and make sure that we are designing systems and training operators with the resilience to be able to recognize and identify an intruder and be able to mitigate any harm or any damage.

There are a number of things that we're doing in that realm. We've recognized that a lot of the training for our submarine information technology specialists, the ITS community, a lot of that training was probably inadequate; it was not pacing the threats. We've invested heavily in the schools and on the officer curriculum as well to try and give our officer corps greater awareness of the threat and ability to deal with it.

UNCLASSIFIED

Strategic Deterrence

STRATCOM Family of Plans

- Integrates nuclear, cyber and space operations with geographic COCOM plans
- Address nuclear and non-nuclear strategic threats

Tactical Security – Bedrock for survivability

- Unit-level and Force-level Analysis
- Expanded use of two oceans

USS WYOMING
Faslane, Scotland
16 Sep 2015





Transition to OHIO Replacement

- 2027 – First OHIO decommissioning
- 2031 – First OHIO Replacement patrol



Maximizing Force Ao

- On-time overhauls
- Optimizing for the force may sub-optimize for an individual submarine

Transition Mitigators

- Requires investment in OHIO maintenance today
- Shore based testing
- Mature design prior to build

The U.S. retains a safe and secure nuclear deterrent

16

On the deterrence side, we talked a lot about Ohio Replacement. I would just say that operationally, as has been previously mentioned, we're really blessed to have Admiral Haney as the Commander of U.S. Strategic Command, not only for his advocacy of the Ohio Replacement Program and his recognition of the importance of the sea-borne leg of the triad, but because of his vision and leadership of the discussion of what it means to deter in the modern world. Deterrence is no longer about only trying to keep somebody from firing a nuclear-armed weapon, because there are other means of attack, in cyberspace and in space, that have the potential to have almost similarly catastrophic effects on our way of life, on our economy, etcetera.

So he just last year got approved a revision to the plan, something called the *Family of Plans* that integrates the responses across a variety of threat vectors. The other thing I'd point out is that Admiral Tofalo and I are very concerned about making sure that as the fleet ages and it becomes more and more challenging to maintain the material condition, we've got to maintain the A_0 , the ability of those ballistic missile submarines, and for that matter the

attack submarines, in meeting their underway times in order to generate the forces that the combatant commanders require.



SSN & SSGN



Peacetime Presence

- Non-provocative crisis monitoring
- Geographic familiarity
- Builds foreign relations

Warfighting Readiness

- Demonstrate unit level skills
- Exercise sustained HQ C2
- Exercise wartime logistics

Foreign Engagement

- Multinational exercises
- Submarine and Tender port visits
- Safety and coordination conferences
- Diesel-Electric Submarine Initiative



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I just want to say something on SSNs and SSGNs. Obviously the things that they do, the missions, are not new to anybody. But what I simply want to emphasize here is that the force is doing great. It's just eye-watering what these folks do.

But I want to emphasize again that I think we're being reasonably successful at adhering to what we've set as our goal, which is to have a supply-based Submarine Force. There are always going to be more demands from combatant commanders for submarines than we can generate. In fact, it's about twice as many as we can generate.

So there are frequently requests from combatant commanders—that to respond to this new crisis, this new brushfire, this new concern, I need an additional submarine beyond what my normal global allocation is. There is great pressure to try and then identify somebody who is not yet normally ready to deploy and figure out a way to expedite them, load them out, get them underway, which



perturbs that whole training cycle. Thanks to a lot of support from Navy leadership we've been pretty successful at trying to make the case that we've got a very efficient system that's capable at any given time of having about 10 attack submarines forward deployed anywhere in the world and leave it to the combatant commanders, the Secretary, and the Chairman to figure out where you want them to go. If you really need an 11th or a 12th, we can do that. But let us show you exactly how painful that's going to be and what the impact is going to be through deferred maintenance and missed dry dock availabilities and the ability to generate forces in the years to come. And so, so far we've been pretty successful at that.

The other thing I'd point out here is that as the rest of the world gets more, shall we say interesting.—as China, for example, becomes more assertive—we've never been more popular. That's true of the U.S. government. That's true of the U.S. Navy. That's particularly true of the U.S. Submarine Force.

We've got all kinds of folks around the world who now more than ever want to be our friends, want to be our partners, really want us to show up in their ports on liberty or doing maintenance, really want to be known to be doing exercises with us. That pays off in spades particularly as, as I mentioned earlier, theater ASW is more and more of a team sport.

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Exploiting Unmanned Systems

DEEP SENTRY
Submarine launched UUVs
Conducting real missions today

BLACKWING
Sub launched/controlled UAS
Planned Deployment FY16

ULRM Deploying from SSGN

3" launcher-deployed
~45min endurance
Encrypted data links

18

My predecessors here on the podium have really already talked about these things, but unmanned systems clearly are the future for us.





Let me then kind of use this as my get off the stage slide. I finish here with people because that's really where it all begins in the Submarine Force. Admiral Tofalo already mentioned this when he was going through the Commander's Intent. The sixth of those areas that we're focusing on is the challenge, the exhortation for us, the submariners in the Submarine Force, for our partners in industry, for everyone who supports the Submarine Force at a training activity, at a maintenance activity, at a shipbuilder, to be the best. We have been blessed with the people that we have in the Submarine Force, both historically who have gotten us to where we are, to those of us currently serving as we look at the new young millennial entering the Submarine Force right now. I'm very confident we will continue to make the investments in our capabilities and our capacity that will always keep us the world's preeminent Submarine Force. But the secret sauce that we have is our people even if we found ourselves ever in a conflict with adversaries whose submarines had the same capabilities as ours, I'm am completely confident we would come out on top because of our people. The high quality of them entering the service, and

of course the training and experience, they gain is what makes us the world's greatest submarine force. I just couldn't be prouder.

In that regard a couple of things I'd point out, Admiral Tofalo had mentioned that we had just integrated our first female 1120s on attack submarines. One of those submarines, USS MISSISSIPPI, just left on deployment, so that's a bit of a milestone. Admiral Tofalo also mentioned the expansion of opportunities now for enlisted women in submarines. I just was up in the Pacific Northwest last month and was able to shake the hand of the first woman, a female corpsman chief petty officer, to report onboard USS MICHIGAN. The modifications to the hull are well underway and that is going to be yet another great success that is only going to make our Submarine Force better.

And then all these things that you see on here, these are all just some of the different programs you may have heard of, or read about which are all designed to try and ensure that our Navy and our Submarine Force continue to have the very best people and to keep the very best people. One of the things Admiral Mulloy mentioned is that before I was blessed to escape the beltway I was doing a lot of this work for CNP. One of the things that I think is going to be a real challenge is that looking across America today it's only about 25 percent of the young men and women 18 to 20 years old who are even eligible to serve in our military. Of those, a much smaller number are even aware of or interested in serving in our military, or serving in our Submarine Force.

So we've got a challenge to try and make ourselves an employer of choice so we can compete for all the best talent that's in America. And then the best talent that joins the Navy, we need in our Submarine Force. And we need them not only in the door, they are the ones that we need to make sure that we retain to be our reliefs.

So, thank you for your time. With that I'd be happy to take as many questions as Admiral Padgett says I can take.

MR. BRAD KRATOVIL: Admiral, Brad Kratovil. Earlier in the conference they talked about going from three to four – we've made the shift from three to four SSNs in Guam. I was wondering,

from your perspective does it make sense to put anymore there than the four?

RADM ROEGGE: Thanks, Brad. The question has to do with the force laid down through the Pacific, and in particular for Guam. It was about 10 years ago that we recognized that even from some place as far away as Pearl Harbor -- and having just gotten off the plane I can tell you it's a long way -- even from some place as far away as Pearl Harbor, it's still even further away to get to all those places out in the Western Pacific where the nation needs us to do our work. So we forward deployed three attack submarines to Guam about 10 years ago and cut that distance by more than half. That has been hugely successful at generating forces that are spending less time in-transit and more time in-theater at the tip of the spear.

Just this last year we added a fourth SSN. In fact, we just this last year also got approval to change the home port for the USS EMORY S. LAND so that when she returns from her current deployment we will now have two tenders also permanently home-ported in Guam. So that's all good.

We've done studies that indicate there is some additional capacity in Guam, so if we were to decide to try and put more forces out there that is an option we could consider with some additional infrastructure. But this is a discussion that is going on not only in the Submarine Force but the Navy and all of DOD. One of the things that we have to be conscious of is kind of the demands on the island as a whole. In fact, I think it was when we were first talking about putting three SSNs out there that some, I'm sure well-natured questioner, was worried about whether the island was going to sink by all this burden of military personnel.

But we've got 1,900 Marines who are being reassigned from Okinawa who are showing up in Guam this next year. There's a lot of discussion about whether the pivot to the Pacific should include carriers? Should it include an ARG? Should it include additional surface ships, etcetera? Obviously, all those Navy resources would then compete for some of the support services there in Guam.

In terms of A_o, I think it would be good. It would improve our A_oa little bit. But it has to be part of a broader kind of a strategic approach to what we put in Guam. At the moment, we have no plan to go beyond where we are right now.

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MEMBERSHIP APPLICATION FORM

Name: _____ Birth Year: _____

Rank/Rate, Service (if applicable): _____

Duty Station (if applicable): _____

Preferred Mailing Address: _____

Telephone Number (H/O/C): _____
Circle one

E-mail (Home): _____ (Office): _____



THIS SECTION MUST BE COMPLETED BEFORE YOUR APPLICATION WILL BE PROCESSED



I hereby apply for membership in THE NAVAL SUBMARINE LEAGUE. I certify that I am a citizen of the United States or a citizen of _____ . I also certify (check one) that _____ I do not or _____ I do act as an agent, representative, employee (includes active duty military), or in any other capacity, at the order request or under the direction or control of the government of a foreign country or a foreign political party. If "I do" is checked above, a brief description of the foreign affiliation must be provided with the application.

Signature: _____

NAVAL SUBMARINE LEAGUE MEMBERSHIP APPLICATION

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The following Membership levels include only the electronic version of The Submarine Review.

Please check the applicable membership level:

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CHECK

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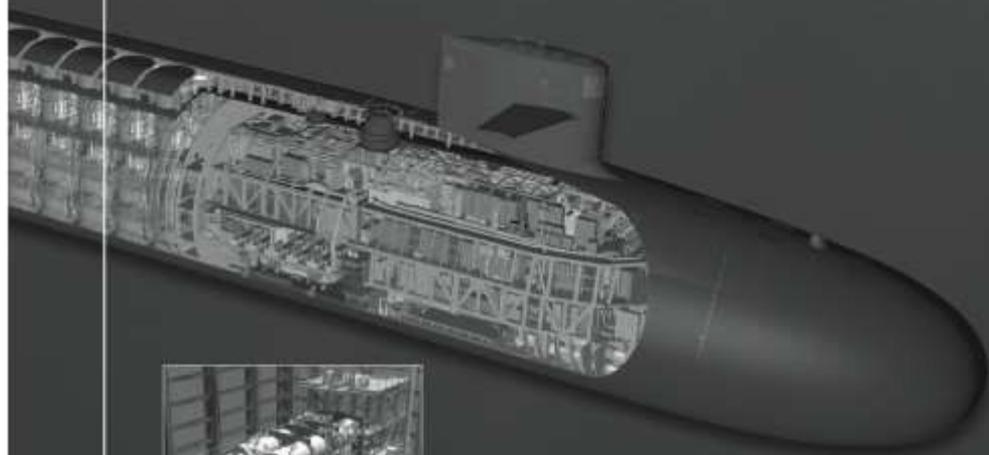
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