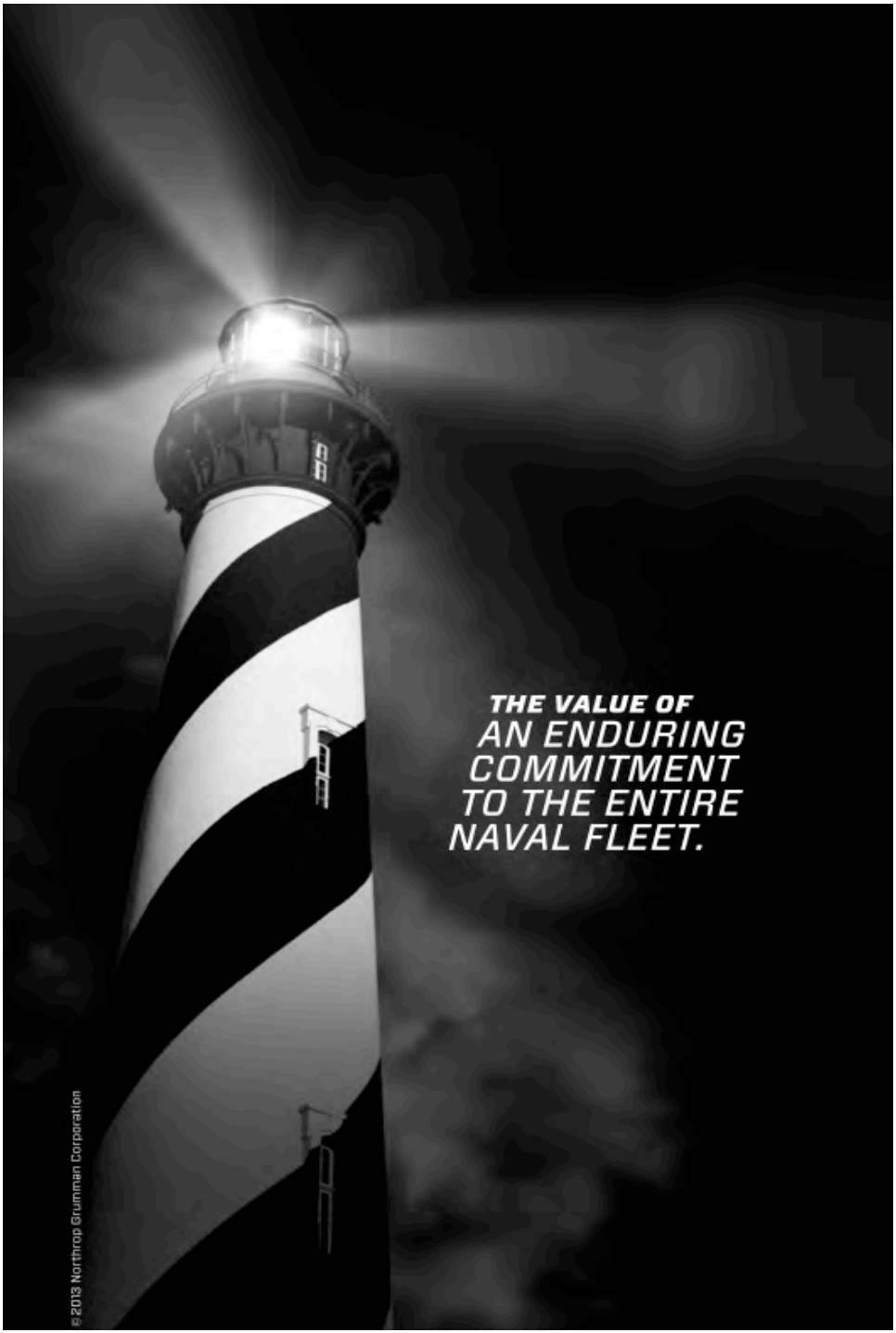
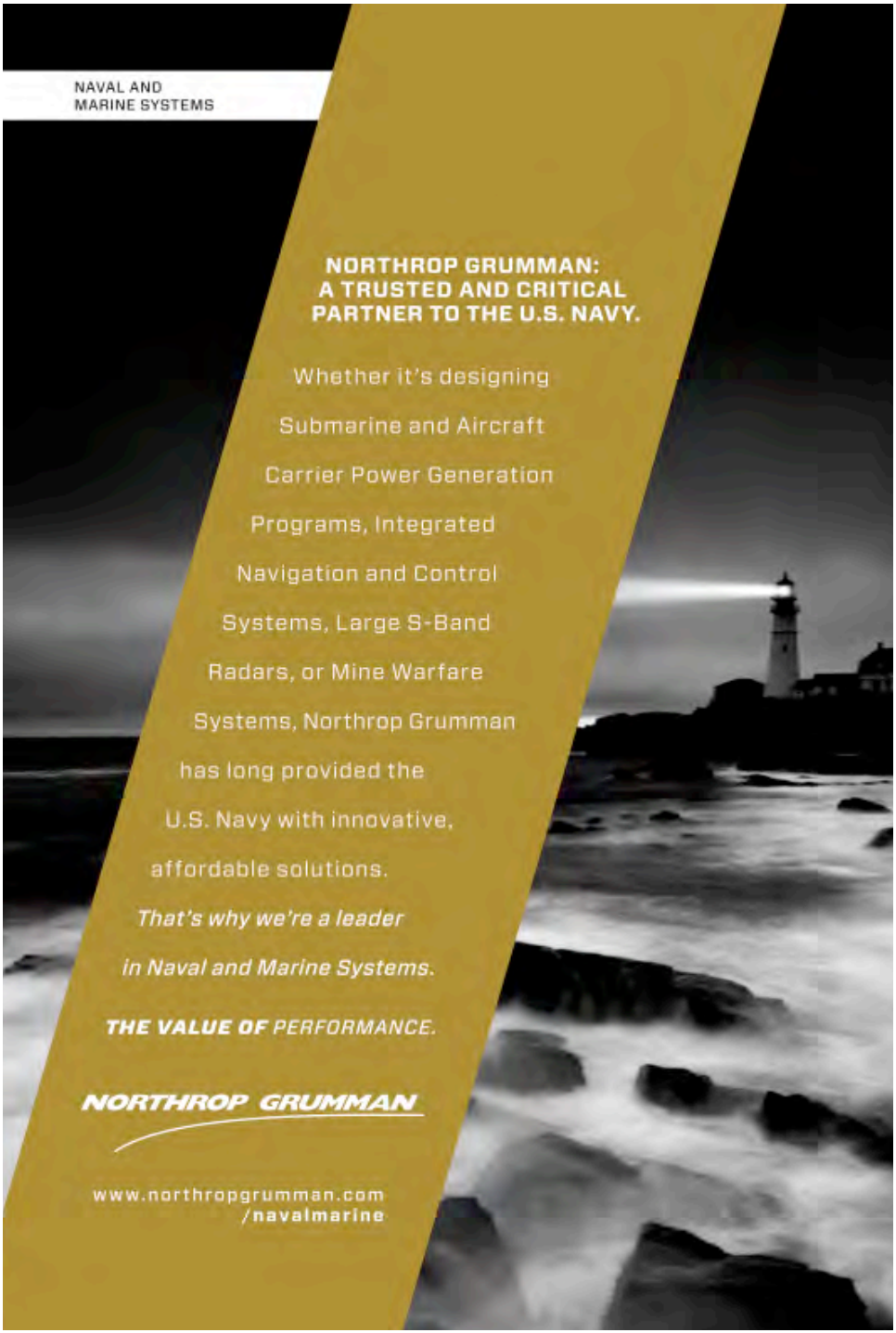
WINTER 2014

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EDITOR'S COMMENTS

A primary mission of the Naval Submarine League is to inform the readership and educate the public about the value of a credible and dominant Submarine Force to US national security. The original source of the best information about the USN Submarine Force comes from the leaders of that Force, and from their seniors at the national policy level. Accordingly, the Naval Submarine League sponsors frequent opportunities for those officials to inform us of their aims, efforts and accomplishments. THE SUBMARINE REVIEW then publishes those policy statements for the widest possible distribution.

This issue of the magazine is especially rich with such policy statements from two members of the Congress, the senior submarine commander, the submarine officer in the Pentagon who handles all submarine programmatics and the Naval Sea Systems Program Executive Officer for Submarines, who builds those amazing modern crafts. Between those three Flag Officers a vivid and detailed picture is painted of the current and near-future Submarine Force and what it will be doing in the far reaches of the world's oceans. Just as important, the statements by Senator Blumenthal of Connecticut and Congressman Wittman of Virginia testify to the acceptance in Congress of Submarine Force aims and performance, and their support for submarine programs in these fiscally difficult times.

In addition, observations and some recommendations are offered by Mr. Ron O'Rourke, an honored and highly skilled assessor of naval affairs. He notes the emergent trend of comments from various sectors of the foreign affairs community regarding a significant "shift from one strategic era to another—from the post-Cold War era…….to a new era of renewed great power competition." The implications of such a change in strategic era, if indeed it is happening, can be very serious. Mr. O'Rourke characterizes such change as "…challenges to key elements of the US-led international order.…" After discussing three of four challenges, Mr. O'Rourke highlights "A fourth challenge: thinking

through the implications for the Navy, and for submarines". This subject is far reaching and is an important concept for all to consider—in depth and soon.

Mr. O'Rourke ends his observations by switching from strategy to budgets in terms of the submarine shipbuilding programs. Again, these are cogent comments from a knowledgeable naval analyst with long experience on Capitol Hill.

There is one other very unique article in this issue. Command Master Chief Antoine has given us a great description of the submarine-unique position of **Chief of the Boat**. The rest of the Navy has adopted the concept of a senior enlisted advisor but none have incorporated the full functions of a submarine COB. It remains a submarine-specific position with a long tradition and a highly valued place in each submarine. It is also a difficult concept to explain to the non-submarine world. Just as is submarine qualification, with its very real connotations of small unit integrity based on mutual dependence in real emergencies. We are indebted to Command Master Chief Antoine for putting into words the spirit of USN submarining as we all know it. It is technical excellence and military performance written large. We shall keep this article close at hand and republish it from time-to-time just to remind us all of what we are about.

Jim Hay
Editor

FROM THE PRESIDENT

The Submarine Force continues to excel while meeting the challenges of a demanding operational, fiscal, and political environment. Our Submarine Force leadership has defined a clear path forward that will guide our forces as they address future challenges in what is sure to be a dynamic and demanding environment.

The Submarine Force leadership has established and sustained the highest operational and maintenance standards and has reemphasized consistent priorities to ensure that our submarines are optimized to meet current and future requirements.

The OHIO Replacement Program is the top priority for the Submarine Force and the Navy, and this program enjoys broad based support in the Congress while making excellent progress in design and engineering, supporting the Navy's Shipbuilding Plan.

Sustaining a build rate of two VIRGINIA Class submarines per year received a strong endorsement in late April as the Navy awarded a contract worth nearly $18B for Block IV of the VIRGINIA Class Submarine Program—ten ships over five years!

Strong bipartisan Congressional support and the Navy's sustained investment in the design of the VIRGINIA Payload Module reflects solid consensus on how best to align the capability and capacity of our future Submarine Force to meet future demands.

Ongoing efforts in the evolution of current submarine payloads and adapting other payloads for submarine use, while thoughtfully examining new payloads to meet anticipated future requirements, provide the foundation for a vigorous and rigorous plan to ensure that the Submarine Force sustains relevance in the future while maintaining dominance throughout the undersea domain.

As this issue of THE SUBMARINE REVIEW goes to press, the 2014 Submarine Technology Symposium, a classified symposium that the Naval Submarine League co-hosts with John Hopkins University Applied Physics Laboratory, was held. After a one year hiatus in the midst of last year's Sequestration implementation, this event provided the US submarine community a forum where requirements and visions for advanced technologies and research and development initiatives with government, industry and academia can

be discussed and examined. The Theme this year was "Technological Innovation to Influence Offensive Operations". In the past, SUBTECH presentations have stimulated meaningful discussion and have frequently stimulated follow-on initiatives that have led to improvements throughout the Submarine Force. I look forward to hearing more of these types of discussions.

At the most recent Board of Directors meeting in February, there was discussion about the importance of attracting new members, and, in particular, active duty submariners, both officer and enlisted, to join the Naval Submarine League. The energy and enthusiasm of the Naval Submarine League and its ability to educate the American public about the importance of submarines to our nation's defense will be greatly enhanced by expanding our membership base and focusing on the next generation of members. A Membership Growth Committee has been established to review this issue and the Committee will consider a number of initiatives to lower the cost and enhance the value of membership. There is particular emphasis on junior submariners, both enlisted and officer, and on encouraging Naval Submarine League members to strongly consider becoming Life Members. Reduced rates for membership are key to this initiative and are being carefully evaluated. Of note, these new rates are possible, in large part, because of the hard work of Jim Hay and Kristin Bernacchi that allows THE SUBMARINE REVIEW to be provided in an electronic format. We expect that the Membership Growth Committee will complete their review within the next few weeks and the results to be approved and promulgated this summer.

In February, as part of our annual recognition of our Naval Submarine League Corporate Benefactors, the Submarine Force leadership provided in depth updates and forecasts addressing operational, programmatic, and fiscal issues to inform our views regarding the way ahead in these most interesting times. In addition, we were fortunate to be joined by Senator Richard Blumenthal of Connecticut and Representative Rob Wittman of Virginia, both solid supporters of a strong Navy and a strong Submarine Force. These legislators shared their views and insights on the importance of the OHIO Replacement Program, the value of continuing to build two VIRGINIA Class Submarines each year, and the need for continued development of the VIRGINIA Payload Module within the context of

a robust Navy Shipbuilding Plan. They also strongly committed to work hard to sustain future support for these priorities, and emphasized that strong support and informed advocacy by members of the Naval Submarine League will continue to be important for the sustained success of our submarine programs.

Recently, in April, the Naval Submarine League, in conjunction with the Naval Historical Foundation, sponsored our annual History Seminar addressing "A Century of United States Navy Torpedo Development". The seminar stimulated thoughtful discussion, and provided a superb forum to learn about torpedo developments, past, present, and future. The presentations are available in our office if you missed the event. These seminars are a great way for the Naval Submarine League to reflect upon and learn from the past and they provide an opportunity to apply what we have learned to challenges that are to come. Also, and importantly, at this year's seminar, we were able to acknowledge and express appreciation for RADM Jerry Holland's years of superior service to the Naval Submarine League as the Chair of the History Seminar and to welcome CAPT Dave Rosenberg as the new Chair.

As a reminder, the 32nd Annual Symposium will be held at the Fairview Park Marriott in Falls Church, VA from 22-23 October 2014. I look forward to seeing you all there.

As we support the Submarine Force engaging the diverse challenges that lie ahead, please engage those with whom you come in contact to remind them of the tremendous value of the Navy and the Submarine Force in sustaining a firm national defense posture and a stabilizing forward presence in an unsettled world.

Enjoy the summer and I hope to have seen you at the SUBTECH Symposium and I look forward to seeing you at the Annual Symposium in October.

John B. Padgett III
President

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JHU/APL SUBMARINE TECHNOLOGY SYMPOSIUM

THE HONORABLE RONALD O'ROURKE

MAY 13, 2014

Thank you for introduction, and for the invitation to speak to you.

As usual, I need to issue the standard disclaimer that these remarks are my own and do not necessarily reflect the views of CRS or the Congress.

In my talk today, I want to start at the general or strategic level, because there are important developments there to discuss, and then proceed to more specific issues.

Strategic situation

So let me begin with the strategic situation. Events over the last several months in the East and South China Seas, and in Ukraine, have convinced a number of analysts that we are now in the midst of a shift from one strategic era to another—from the post-Cold War era (or unipolar moment, as some have called it) that began around 23 years ago, to a new era of renewed great power competition.

There is debate on this point—not everyone agrees that such a shift in strategic eras is occurring. But among those who believe that it is, the view is that this new strategic era will be characterized by challenges to key elements of the U.S.—led international order that we have come to take for granted over the last two decades or so.

These challenges include a greater use of force and coercion by major powers as a routine or first-resort method for settling disputes and achieving foreign policy goals—in other words, a reassertion of the principle that might makes right—as well as a challenge to the fundamental and long-established precept of freedom of the seas.

Furthermore, in this point of view, the emerging strategic era will be characterized by new, 21st Century forms of aggression and coercion that are characterized by a fusing of grey-zone or deniable activities by military and paramilitary forces, cyber operations, and control of media for the broadcasting of propaganda and supporting narratives.

Behind these challenges to the international order, in the view of these analysts, are governments in China and Russia that are quite different from one another, but which, in their own ways, appear to be shoring up their legitimacy through the use of nationalistic and chauvinistic narratives that are grounded in part in an asserted sense of resentment over past injustices supposedly inflicted by the West, and by the pursuit of irredentist and revanchist foreign policy goals that are intended to reverse these past injustices.

If that is a more-or-less accurate description of the dynamic at work, it would be highly significant, for at least two reasons. First, we have not seen a combination of nationalism and irredentism driven by a sense of supposed victimization take hold as a significant element in major power politics since the 1930s. And second, in the case of China at least, we may be witnessing an attempt by a major power to become a regional hegemon in its own part of Eurasia, and it has been a longstanding goal of the United States going back several decades, in both peace and war, to prevent the emergence of a regional hegemon in one part of Eurasia or another.

The first challenge: recognizing a shift

If these analysts are correct that we are witnessing a shift in strategic eras of the kind just described, then what challenges might that pose?

Well, the first challenge would be to recognize that it is happening, and that is not a trivial challenge, for at least four reasons.

First, although Russia's seizure of Crimea was a pretty stark event, the markers of this potential shift in strategic eras have for the most part been less dramatic and clear-cut than the fall of the

Berlin Wall, the collapse of the Warsaw Pact, and the dissolution of the Soviet Union.

Second, many younger professionals who today work on foreign policy and security issues, as well as older professionals who started working these issues within the last 20 years or so, have not lived through a shift in strategic eras in connection with their work. Many of them lived through 9/11, which led to some important changes in the strategic setting, but those changes, it can be argued, amounted to a major adjustment within the unipolar moment, rather than a full-scale shift in strategic eras.

For those who have been working foreign policy and security issues only within the last 20 years or so, the post-Cold War era has been the sole strategic construct within which issues have been identified and debated. That the post-Cold War order as we know it may not, in fact, be permanent, and that it may be ending right now, may seem strange to them. Their knowledge of what to look for in assessing whether a change is taking place, and their readiness to truly shift their thinking as a result of such a change, may not be well developed.

Third, even among those who can see such markers and know how to recognize a shift in strategic eras, there may be an unwillingness to acknowledge this shift, because the era that we may be heading into looks less pleasant than the one we've been in. One commentator, writing earlier this month rather pointedly about Vladimir Putin, stated, "Even today, many are having trouble recognizing the true nature of a man who is currently in the process of turning the European peace order on its head. Perhaps we don't have the courage to make the right comparisons because they remind us of an era that we thought we had put behind us."[1]

And lastly, a lot of programs, careers, and reputations have been built up over the last 20-plus years within the familiar framework of the post-Cold War era. Consequently, there may be vested interests in arguing that the post-Cold War era is not ending, and a reluctance by those with such vested interests to admit that it might be.

A second challenge: reacquainting ourselves with the link between geography and U.S. naval forces

If it is correct that we are witnessing a shift to an era of renewed great power competition and a consequently to a renewed focus on geopolitics, then a second challenge would be to reacquaint ourselves with the influence of geography on the structure of U.S. military forces, particularly given a U.S. strategic goal of preventing the emergence of a regional hegemon in one part of Eurasia or another, and how this can lead to, among other things, a U.S. Navy with features that differentiate it considerably from the navies of other countries.

I included some remarks about this topic in testimony I gave to the Seapower and Projection Forces subcommittee of the House Armed Services Committee on October 23rd of last year. You can get that testimony from the committee's web site, and I also understand that portions of it, including this portion, were reprinted in a recent issue of THE SUBMARINE REVIEW.

A part of this challenge involves recognizing the value of submarines not only as platforms for penetrating and countering anti-access/area-denial forces, but more broadly, but as platforms that establish U.S. dominance of the undersea domain, which in turn forms the foundation for the United States being able to convert the world's oceans into a medium of maneuver and operations for projecting U.S. power ashore and otherwise defending U.S. interests around the world. The ability to use the world's oceans in this manner—and to deny other countries the use of the world's oceans for taking actions against U.S. interests—constitutes an immense asymmetric advantage for the United States. Over the last year or so, I have been interested to observe that an awareness of the value of the Submarine Force in generating this asymmetric advantage appears to be growing among policymakers.

A third challenge: restructuring the debate on defense

Continuing on, if it is correct that we are witnessing a shift in strategic eras, then a third challenge would be to consider whether to restructure the current basic framework of debate over U.S.

defense plans, programs, and budgets. That framework is established by things such as the Budget Control Act of 2011 as amended, the Defense Strategic Guidance of 2012, and the 2014 QDR.

The question is whether this framework reflects the strategic era we are leaving, but not to the one we may be entering. The issue, in other words, is whether the terms of debate over defense spending that we have become familiar with over the last few years are becoming, in effect, a dead man walking, leading to a zombie debate on defense, if you will.

If the terms of debate over defense spending are not responsive to the strategic era we may be entering, it may take some time to recognize and acknowledge this, because there are vested interests in the current terms of debate, and because, vested interests or not, the mental and bureaucratic grooves associated with the current terms of debate are fairly deep. It might not be until the next administration—no matter who is elected in 2016, from whatever political party—that a critical mass forms for restructuring the debate to be fully responsive to a new strategic era.

A fourth challenge: thinking through the implications for the Navy, and for submarines

And finally, if we are witnessing a shift in strategic eras, then a fourth challenge, for this audience, would be to explore, specifically, how a change in the terms of debate over defense issues might affect the Navy in general, and submarines in particular.

On this question, one reaction you might have had, listening to me for the last few minutes, might be something like: "Hey, I think there's going to be more money for defense!" And that's a possibility. But it's not a certainty, since the country will face a choice as to how to respond to the new strategic era, and it's possible the country will choose to respond in ways that do not lead to higher defense spending. And it bears remembering that the Budget Control Act, with its statutory limits on defense spending, remains in place, and that among those who do not like

the BCA, there is little consensus on what kind of arrangement should replace it.

Taking a step down from the question of the DOD top line, another issue to explore concerns the Navy's share of that top line. Here, the situation is a bit complex. One the one hand, there seems to be growing traction for the idea that in light of the strategic rebalancing to the Asia-Pacific, a greater share of the DOD budget should go to the Navy and Air Force, since the Asia-Pacific is, for the United States, primarily a maritime and aerospace theater.

On the other hand, events in Ukraine have put renewed attention on our ground-forces presence in Europe, and on the importance of land-based forces for fulfilling our treaty obligations there.

And there is one more thing for this audience to begin thinking through, which are the implications of this new, 21st Century form of warfare for the attack Submarine Force. The key issue is this: What contribution can Navy attack submarines make in defending U.S. interests against this new form of aggression and coercion?

In the Ukraine, the answer is probably not much, given the land-oriented geography of the region and the Montreux Convention's limits on naval forces operating in the Black Sea.

China's near-seas region, however, is a largely maritime area. Here, the challenge is China's salami slicing strategy—its strategy for accomplishing a creeping annexation of, or gradual consolidation of control over its near-seas region, including the East and South China Seas, through a series of incremental actions, none of which individually amounts to a casus belli.

China's salami-slicing strategy in its near-seas region poses a direct challenge to other countries situated on those seas, but it also poses a potentially significant challenge to the United States, for two at least reasons. First, if China were to gradually annex or consolidate control over its near-seas region, it could form part of a broader effort by China to become a regional hegemon.

And second, if China were to gradually annex or consolidate control over its near-seas region, it could give greater legitimacy to China's views regarding the legal regime for waters beyond the 12-mile limit.

China's views on this matter appear to be quite different from the views held by the United States and many other countries, and seem to be much closer to the position that the high seas should be treated as territory, rather than as an international commons. This is a view that goes against hundreds of years of customary international law of the sea.

If China's views regarding the legal treatment of the high seas were to become established in its near-seas region, it could affect the U.S. ability to use naval forces for defending U.S. interests not only in that part of the world, but possibly in other parts of the world as well, because international law is universal in its application, and a challenge to it in one part of the world, if sustained, could serve as a precedent for challenging it in other parts of the world.

Given these stakes, the United States, if it has not done so already, might consider it a matter of some urgency to devise a strategy for countering China's salami-slicing tactics in its near-seas region. And the challenge for the submarine community would be to figure out how the attack submarine force might contribute to such a strategy—and not just in terms of surveillance and reconnaissance. Since this is a matter of some urgency, as daily news stories from the East and South China Seas make clear, the challenge is to think quickly about this issue. If you haven't been following this situation in detail, now's the time to get up to speed on it.

The role of attack submarines in a potential major conflict with China has presumably been explored in detail for some time now, but that's not what I'm talking about here. I'm talking about the role of submarines—beyond ISR, which is the easy part to imagine—in a U.S. strategy for countering China's ongoing salami-slicing strategy in the absence of a conflict.

Funding for Navy Shipbuilding

I want to shift now from strategy to budgets, and specifically to the issue of future funding for Navy shipbuilding. It's now widely known that fully implementing the Navy's 30-year shipbuilding plan would require increasing the shipbuilding

budget in coming years by something like 30 or 40 percent above the average level it has attained in recent years. The Ohio Replacement program is a big part of the reason for that, but it's not the only contributor to the situation.

The point about how much the shipbuilding budget would need to be increased to implement the 30-year plan has been made repeatedly, and it has sunk in. Repeating this point, and only this point, however, can lead to a sense that fully implementing the 30-year shipbuilding plan is an unattainable goal, and to a feeling of helplessness and resignation about the matter.

In my testimony to the HASC last October 23, I introduced an additional point into this conversation. It's a simple point, based on a calculation you can do in your head in about five seconds, but it's one that had been overlooked, even though it can be useful in providing some additional context for the conversation about the prospective affordability of the Navy's shipbuilding plan.

I simply pointed out that the additional funding needed to fully implement the 30-year shipbuilding plan equates to 1.5% or less of future levels of defense spending under the BCA, and that in a context of allocating a larger share of the DOD budget to naval and air forces as a consequence of the strategic rebalancing, shifting 1.5% or less of the DOD budget to the shipbuilding account would appear quite feasible.

Introducing this additional point can change the conversation about the affordability of the 30-year shipbuilding plan, and indeed, the conversation has now changed.

Of course, it's not just a matter of building ships, but of operating and supporting both them and their embarked aircraft. So I also pointed out in my testimony that the Department of the Navy's entire program of record as submitted in the FY13 and FY14 budget submissions, which was aimed at achieving the 306-ship fleet in all its aspects, could be fully funded, even within the BCA's limits on defense spending, by increasing the Department of the Navy's share of the DOD budget by 4 or 5 percentage points.

That's more ambitious than shifting 1.5% or less of the DOD budget to the shipbuilding account, but I pointed out that there

have been even-larger percentage shifts in DOD budget shares on two previous occasions—to the Air Force in the 50s and 60s, and to the Army between FY03 and FY13—which were done to support U.S. strategy as interpreted by policymakers at the time. As we head into a debate about what might or might not be affordable for the Navy under various DOD budget scenarios, it can be helpful to keep these points in mind.

Ohio Replacement Program

I've talked now a little about strategy, and a little about budgets, so let's now shift to programs, starting with the Ohio Replacement program, and here I want to make five points.

The first is to note that last September, the Navy stated explicitly in testimony to the HASC that the Ohio Replacement program was the Navy's top program priority, meaning, the Navy explained, that the Ohio Replacement program will be fully funded, even if funding for other programs needs to be reduced as a consequence.

What this means is that if there is a funding crunch in the shipbuilding budget, it will not be the Ohio Replacement program that will be cut back, but other programs, including, for example, the Virginia-class program.

What this also means is that the aim in setting up a separate fund in the DOD budget for the Ohio Replacement program, as has now been proposed in the HASC-reported version of the FY15 NDAA, is not so much to protect funding for the Ohio Replacement program, but to protect funding for other shipbuilding programs, including the Virginia-class program.

The second point is that this year's deliberations on the FY15 budget have underscored that while the Ohio replacement program is the Navy's top program priority, and consequently will be fully funded, it has, at the same time, paradoxically become somewhat of a brittle program, because there is no longer any slack in the program's schedule, due to the lead boat's procurement having been deferred to FY21.

As a result, even relatively small funding shortfalls or instances of funding instability can now create a risk of the lead boat

not being ready in time for its first deterrent patrol.

We've already seen that in this year's deliberations on the FY15 budget, due to an $11-million shortfall in the DOE part of NR's budget. This shortfall, if not addressed, could cause something like a 6-month delay in the designing of the boat's nuclear core. So here we have a program whose total acquisition cost will be in the tens of billions of dollars, now facing a schedule delay because of an $11-million shortfall.

This issue is being addressed as we speak, so the point is not that the delay will happen. The point is that every year between now and the late 2020s, those connected to the Ohio Replacement program will have to be on constant lookout for smaller-scale funding shortfalls and instances of funding instability that could cause problems in the program's schedule.

The third point is that there is growing awareness of the possibility of reducing the cost of the Ohio Replacement boats by acquiring them through a joint, cross-class block buy contract with the Virginia class program. There appears to be interest in this option, at least on the authorization committees.

Whether this is the best possible contracting strategy, and how much it might save, have not yet been determined, but the groundwork for discussing the option has now been put into place.

The fourth point is that announcements about progress that the Navy has made in reducing the estimated cost of the boats 2 through 12 in the program, so as to get closer to the target cost for these boats, have been few and far between. I understand that this is because these announcements are tied to acquisition milestones, but these milestones are widely spaced. The Navy might consider looking for a way to make announcements about progress in reducing the cost of these boats more frequent, so that the ongoing conversation about the cost of these boats can reflect this progress on a more up-to-date basis.

And the fifth and final point I want to make about the Ohio Replacement program would be to consider making more prominent the fact that this submarine will employ an electric drive system, and that this system presumably could be adapted to become the electric drive system for the next-generation surface

combatant that the Navy is now beginning to scope out. Right now, there is little discussion of how research and development work for the Ohio Replacement boats could benefit the rest of the Navy. The electric drive system is a major example in that regard, but we've heard almost nothing about that.

Virginia-class program

I want to shift now to the Virginia-class program, and here I want to make two points.

The first is that in light of the strategic rebalancing and concerns over China's naval modernization effort, as well as the Virginia-class program's success in reducing procurement costs and delivering boats ahead of schedule, there is strong support among policymakers for procuring two Virginia-class boats per year.

Congress' action to provide funding for a second Virginia-class boat in FY14, which became the 10th boat in the current multiyear, is emblematic of that.

The second point is that there was some push back last year from the appropriators on the Virginia Payload Module. Given that, it is clear the Navy has some work to do to in terms of arguing the affordability and cost effectiveness of the VPM. The estimated cost of the module has come down over the last year or two, which has made it easier for the Navy to make that case. Additional reductions in the estimated cost of the module could further strengthen the Navy's argument.

Submarine-launched unmanned vehicles

Finally, I'd like to talk for a moment about submarine-launched unmanned vehicles—both UAVs and UUVs. And here, I'd like to make two points.

The first is that, with the focus on the Ohio Replacement program, the Virginia-class procurement rate, and the Virginia Payload Module, the topic of submarine-launched UVs, which may well be critical to the future of the attack Submarine Force, can easily be pushed into the background.

The second point, and my final one here today, is that for

outside observers, there is no clear sense that the experiments and demonstrations that the submarine community has been doing with UVs over the last several years are going to lead any time soon to programs of record for procuring operational systems and getting them deployed in the force in significant numbers by a date certain. If the submarine community has plans of that kind, the community might consider giving them more prominence. And if there are no such plans at present, the community might consider taking steps to create them. I've mentioned this issue before, but it bears repeating, because there continues to be relatively little in the way of major observable developments on this issue.

Conclusion

In conclusion, and working backwards through my remarks, here are some specific options to consider:

- First, consider doing more to show how the submarine community's work with unmanned vehicles will transition by a date certain into one or more major procurement programs of record.
- Second, consider doing more to show how the electric drive system being developed for the Ohio replacement program might benefit the Navy's next-generation surface combatant.
- Third, consider finding a way to make the Navy's announcements about progress in reducing the cost of the follow-on Ohio Replacement boats more frequent.
- And lastly, consider exploring how the attack submarine force could contribute—in ways other than ISR work—to a U.S. strategy for countering China's salami-slicing strategy in its near-seas region.

Thank you again for the invitation to speak. I hope you found these remarks, helpful, and I look forward to your questions.

ENDNOTE

1 Jan Fleischauer, "Opinion: Putin's Not Post-Communist, He's Post-Fascist," Spiegel Online (www.spiegel.de), May 2, 2014.

NAVAL SUBMARINE LEAGUE
CORPORATE BENEFACTORS' DAY

LUNCHEON ADDRESS
FEBRUARY 27, 2014

SENATOR RICHARD BLUMENTHAL (D-CT)
SENATE ARMED SERVICED COMMITTEE;
CHAIRMAN READINESS SUBCOMMITTEE

Thank you, Admiral Mies. I can't imagine a greater honor than to be introduced by Admiral Mies, whose contribution to our military and our nation are legendary around the country and particularly in our community. I know that Jeff Geiger of Electric Boat is here today and a number of extraordinarily distinguished individuals who have contributed so much: Admiral John Richardson, Vice Admiral Mike Connor, Vice Admiral Terry Benedict, and Rear Admiral Joe Tofalo, Rear Admiral Dave Johnson—all very distinguished members of our military establishment.

I am proud to serve on the Armed Services committee and also the Veterans' affair committee. I am somewhat limited in time today because, as many of you know, we are considering, literally as we speak, Senate Bill 1982, the Veterans' Affairs Comprehensive Measure that has come to the floor. I am helping to lead that effort because I am a member of the Veterans' Affairs committee and actually sought to be on the Veterans' affairs committee as I also asked to be on the Armed Services committee. Because, not only of my personal interest, but also I happen to have two sons; one who served in the Marine Corps Reserve and was deployed to Afghanistan, and he is now back, fortunately. The other is a Navy officer going through training in Coronado. He has told me that I can't talk about what he's doing. That's not the first time that one of my four children has told me I can't talk about what he or she is doing. But I've very proud of them and proud to be here with such

great military veterans and really the folks who make America the strongest and greatest nation in the world.

Washington can be a very frustrating and sometimes infuriating place, but I try to look at the bright side. I don't know if you've heard this story about the gentleman who had a friend opening a new branch bank, and he decided to send flowers to his friend on the occasion. And he sent flowers. The friend looked at the flowers, thought they were very nice and then looked at note that went along with it, and the note said, "May you rest in peace." Needless to say, he was a little bit curious, so he showed this note to his friend, and the friend of course was absolutely mortified. He went down to the florist, and said, "How can you possibly send that kind of note?" The florist said, "Well, you've got to look at the bright side. Somewhere at a gravesite, there is a beautiful bouquet with the note saying, "Welcome to your new location." So you have to look at the bright side.

We face a lot of challenges, as you well know having seen the new budget that's come from the President. We have to do more with less. We'll have a different kind of military, winding down the wars, downsizing the Marine Corps and our armies to levels we haven't seen since before World War II. But fortunately, those budgets provide for a very robust submarine program. And I say that not just because they're made in Connecticut, and I know Rob Wittman is here from Virginia, and you've heard from him. It's not just a Connecticut interest, it's a national interest. And I'm really proud and always excited to talk about submarines because I've learned a lot about them. Everything I've learned just further supports and reinforces what I have come to think of the submarine fleet being absolutely central and essential to our strategic interests.

Here in Connecticut we are very proud to make submarines. And we have some of the great workforce and some of the greatest companies involved. It's not just Electric Boat, of course. It's all of the suppliers, all of the chain of manufacturing who make parts of those submarines. It is really rooted deeply in the fabric of our manufacturing base in Connecticut. We make submarines and we make the parts and components that go into the submarines. The

folks who work on those submarines are among the most dedicated civilian manufacturing workforce in the world. It's part of our DNA at this point that we make submarines in Connecticut, and we're proud of it. But it should be part of the nation's DNA that we are committed to a strong Submarine Force.

I don't need to tell anybody here the critical part that submarines played in the Libyan operation. Just to take one example: USS FLORIDA delivering force on target, knocking down the door, softening the Libyan forces in an extraordinarily precise and strategic way—virtually unknown to the public. If you ask about the USS FLORIDA off the coast of Libya, you might well get, "What? A submarine in the desert?" Few people understand the role submarines play in delivering special operators or gathering intelligence or of course as a deterrent. The OHIO-class submarines are one of the most—I'm tempted to say the most versatile and diversely valuable platforms that we have in the military today. In preserving the submarine manufacturing program, I'm proud of the fact that they're made in Connecticut, but I am equally determined that wherever they're made, we need them. Wherever they're manufactured, we need those submarines.

We face a growing threat in the Pacific and the shift to the Pacific is, I think well-founded, but we also have to be mindful that the 60/40 split of our submarines between the Pacific and Atlantic should not ignore the Middle East and should also take into account the growing threat elsewhere in the world from submarine manufacturers of all different types. Asymmetric threats can be presented to our merchant fleet in parts of the world where we may be vulnerable. I'm on the Commerce Committee and I'm head of the Surface Transportation Subcommittee which is railroads, roads, bridges, but also happens to include the merchant marine, by some quirk of fate. So I'm very mindful about the potential threats to our merchant fleet that may be posed at sea from Submarine Forces around the world, including the Chinese to be very blunt.

At last estimate, the Chinese have increased their military spending at an annual of 9.7%, a lot of it going into submarines. So we're not alone in this recognition about the versatility and

strategic importance of submarines, and we need to maintain our superiority, not just by a little but by a lot. We have that superiority now. There is nothing to compare with the submarines made in the United States of America, but you know, it is a continuing effort that requires our focus and priority.

That is one of my missions on the Armed Services Committee. What does that mean in specific terms? Well, I'm here to ask for your support. I probably don't need to ask for it, but I'm going to ask for it anyway in three specific areas. First of all, we need to continue developing the Virginia-class force. In fact, we need to contract as soon as possible without delay for a completion of the Virginia-class Block IV series. Our Los Angeles-class ships have a history that is rich and impressive, and they're going to reach their service limit. So we need to move forward on that Block IV series of the Virginia-class as soon as possible.

Second, the Virginia Payload Module must be incorporated in the Block V series insuring that we fill gaps in capability that will arise as the Navy's four guided missile submarines are retired in the 2020s. In the most recent round of congressional appropriations, the program received its full funding of $59 million. But that's just a small part of what needs to be appropriated. Millions more are needed to make it a reality. And the focus again, is to incorporate the Virginia Payload Module into the Block V series.

Third, we certainly need to proceed with the Ohio-class replacement program. We've pursued this goal for years. Many of you know a lot more about this pursuit than I do. I've only been in the Senate for three years. And the Navy conducted a cost control study in 2007. It was over the award of a contract for the missile compartment design of the Ohio-class replacement. That happened in December 2008. More than four years ago. The Navy has yet to confirm an Ohio replacement program, even though we're supposed to be entering into the design phase this year. It is absolutely essential for us to meet our goals for 2029, and we need to initiate this program no later than 2016. I know these dates seem far out, but everybody in this room knows that strategic design, planning, commitment of funding, can't be done the month before or the year before. We need to face our responsibility in

these areas. These goals are profoundly important, but they are attainable. They are feasible even in the time of fiscal austerity that we face right now if we understand and we make the rest of America understand how important they are. That's a goal that overrides everything; the education, awareness, consciousness that we need to create. And I commit to you; I talk about submarines whenever I have the opportunity. In Connecticut, outside Connecticut, because I believe that we need to raise that awareness and spread the consciousness.

Let me just finish on this note: we've been talking a lot about the hardware, the manufacturing. Subs are no better than the men and women who run them. And I want to give a shout out to the extraordinary men and women who are here today who serve our United States Navy. It doesn't hurt that I have a son who's in the Navy, but I think that we need to be mindful of the obligation that we owe to the men and women who serve and sacrifice in an all-volunteer force that have been at war for us for thirteen years. As a United States Senator with a son in the armed forces, for a while I was the only one. Then one of two. I'm now one of three. Like a lot of America, our Congress has not been engaged or even touched by the wars that we've fought, by the sacrifice and service of men and women who volunteered to keep us free. And that's true of our submariners as much or more, and because they are the silent service, we don't see them a lot. We don't hear from them, but I hope that we will continue to recognize the obligation that we owe to our veterans, and that we are debating right now on the floor of the United States Senate. We have to keep faith with all of our veterans and make sure that we leave no veteran behind.

When it comes to the invisible wounds of war, post-traumatic stress, traumatic brain injury, or the horrific visible wounds, we need to make sure that we provide the healthcare, deal with the disability claims backlog and eliminate them, provide skill training and job opportunities. There is no excuse for the greatest nation in the history of the world to have young veterans unemployed at a higher rate than their contemporaries who have chosen to just stay here and go on about their careers. Not saying they should necessarily be given a free pass, but we should not tolerate our

veterans being unemployed at a higher rate than their contemporaries who have not served. I know that I have a lot still to learn about this subject, and I look forward to hearing from you, working with you, listening to you about the needs and challenges that we face together and I thank you for your service to our nation. Thank you very much. I'll be happy to take a couple of questions as long as you don't make me miss a vote...or not. Yes, sir?

Question: Thank you, Senator. Jay Donnelly. Do you see any likelihood that the Congress will agree to another round of BRAC closures? I know Groton suffered a near-death experience in an earlier round, and I just wondered if you could comment on the possibility that might be in the future.

Sure. Well, I asked this question of the proposed nominated Deputy Secretary. We had a back-and-forth about it, and I see no chance right now that the Senate will approve a BRAC in this session. Now, that's based on conversations with my colleagues. I'm not telling anything you don't know already that there's a lot of skepticism, and I think very well founded, because the last BRAC, according to some analysis, actually cost more than it's achieved in terms of saving. These BRACs are not without huge expenses and I believe that the historical pattern indicates that the expenses outweigh the benefits, at least as we've conducted them so far. So, I will oppose them vigorously. Connecticut was fortunate in the last go-round to preserve our Sub Base, and I think that the proposal to eliminate it, which we had to fight, indicates the kinds of weaknesses in the process itself. Putting aside Connecticut's interests in our Sub Base, I think that the BRAC process is not going to be approved by this Congress, despite the recommendation that's been made by the Secretary of Defense.

Question: Yes, sir. My name is Michael Jabaley and I asked Representative Wittman this question this morning so to be bipartisan and bicameral, I'll offer you this same question. In 2013, the Budget Control Act brought us sequestration for ten years; the

bipartisan budget agreement gave us some relief in '14 and '15, so I have two questions: Do you think the bipartisan budget act has set us up for appropriations bills to be enacted on time this year so that we won't have a continuing resolution this fall? And then the follow-on question is, the BBA of course, only covers '14 and '15. Do you see the appetite for a similar-type agreement to go beyond that or will sequestration return in full-force in '16?

I think it has set us up. I don't know what Rob Wittman said. I've heard a number of my colleagues say when they've been asked questions about the future of legislation, if you're in the Congress; you have to be an optimist. For a long time, twenty years to be exact, I was a state prosecutor and before that, a federal prosecutor, so I saw a lot of the stuff that could make you pessimistic. But, I want to sound optimistic and say that I really think on our national defense and on our budget generally, there's a feeling that shutting down the government really is not a great idea. If you look at the politics of it, whoever thought they were going to gain by it, it didn't work out. Because the country, rightly, said, "What are you doing?" And so I think anything that involves sacrificing strategic, vital interests of the United States, because of some proposed or suggested political gain, I think has a high hurdle to overcome even with the partisan gridlock and paralysis that we see all too often. I hope that we're on a path to approved budgets, just as we did the debt ceiling, without a lot of turmoil and anguish and angst and that people will understand. When I came to the United States Senate, I thought to myself, budgets? That's something that we do routinely, right? We disagree about the numbers, but we approve budget and we approve debt ceiling. And so I hope that will go forward

Thank you very much to all of you. Thank-you for your service

NAVAL SUBMARINE LEAGUE
CORPORATE BENEFACTORS' DAY

THE CONGRESSIONAL BREAKFAST
FEBRUARY 27, 2014

CONGRESSMAN ROB WITTMAN (R-VA)
HOUSE ARMED SERVICES COMMITTEE
CHAIRMAN, READINESS SUBCOMMITTEE

Good morning. It truly is an honor and privilege to be with you this morning. Admiral Mies, thank you so much for the gracious introduction. Thank you so much for your leadership. What a great opportunity. You know, we look at the challenges that we face as a nation, and I always look at our glass as being half full. And I think that's the opportunity before us. Will it be a challenge? Absolutely. But I think that we are up for the challenge, and I know that these days, all of us are concerned about where we're going with our nation's defense.

Just this week, we saw Secretary Hagel lay out a plan, a plan that many of us look at and go, "OK, let's ask some questions about this and understand where we're going strategically." I want to emphasize that the strength of our nation's national defense is not necessarily in the technology, but it's in the people. It's in the people that develop that technology. It's in our submariners that are out there in the fleet every day, doing the job that they do. They are the best submariners in the world.

I've been blessed in my office to have some great submariners that have been there serving with me. I had one of our Department of Defense fellows, Lieutenant Commander Tom Weiler, who is now the XO on board USS MICHIGAN and is a great, great individual. I think the world of Tom and he's doing a great job there as the XO. I have an opportunity to travel quite a bit, specifically to visit our men and women in uniform. And one of my cohorts in travel was in the Navy Liaison Office, a gentleman who came with me to Newport News shipyard when we christened

USS MINNESOTA. And this individual, Commander Brian Tanaka, was a Minnesota native. And as we stood there in front of the MINNESOTA, taking a picture, I said, "Brian, wouldn't it be neat if, when you finish your tour of duty here at the U.S. Capitol, to one day command the MINNESOTA?" He said "I could only be so lucky", being a Minnesotan himself and looking to take his first command. Well, you'll be happy to know that just last week, Commander Brian Tanaka took command of USS MINNESOTA. She's going through her sea trials and will be going through pre-deployment training, and he will actually be able to command USS MINNESOTA on her first deployment. So, a great, great opportunity. I know, a dream has come true for Brian. He is an outstanding Naval officer, absolutely one of the best and brightest in our U.S. Navy.

That's what makes our Navy the best in the world, it is the men and women that serve, they are the people in our submarine fleet. We know that's not going to be only the legacy of the past, but they are also charting the future of where we need to go to maintain our superiority at sea. And we have fantastic platforms. The SSN is by far the best attack submarine in the world, by orders of magnitude, and it's the technology that's in that boat. It's the team at HII and Electric Boat that build those boats, that have done such an amazing job of putting the technology together, making the construction process more efficient, and shortening the time frames required. What a great example about how to put together a program, how to build a class of ships, how to get them to sea faster and less expensively. A great model for us to use in the future.

We've got the SSBN[X], the next generation of our ballistic missile submarines, that are hopefully coming on board in time to meet this nation's needs. But I'll tell you, there will be a challenge there as we look at how to put in place the necessary funding for SSBN[X]. We have the dollars there to begin the planning and design process. The concern, though, is the delta between the retirement of the Ohio Class submarines we have today and the availability of the SSBN[X]. As you know, right now a force-level dip where we will have Ohio Class submarines being retired

before the SSBN[X] submarines come online. We have to find a way to close that delta. It is in our national interest. We have to do that. We have to make sure that we are putting that effort forward and that we have those discussions. It is a challenging time to find money in the budget to be able to do that. As our budgets get squeezed, we see those challenges.

Another challenge is for us in Congress to make sure that members understand where the challenges are for the nation. As I talk to other members that are not on the House Armed Services Committee, I stress the importance that they understand what their constitutional duty is, I remind them of Article 1, Section 8, and making sure that they take the time to know what it takes to defend this nation. That's more and more of a challenge these days. We have members in Congress that come from a variety of different backgrounds. There are fewer members of Congress with military experience today than any time in recent history. That military experience gives individual members of Congress a certain perspective on how decisions need to be made. What then happens is those of us that are on the House Armed Services Committee, I think, have an increased responsibility to make sure that we get those members that aren't on the House Armed Services Committee to a point where they understand what this nation's military needs are and how they can be accomplished. That means we have to take them out to see what their nation's military does. I know in the Republican Study Committee, which is a large group of members, that we continue to have discussions about readiness issues and about making sure we understand where the nation's needs are.

Just yesterday, I spoke with that group about what our readiness challenges were going to be in the future and making sure that we get them to understand the aspects of this nation's military. Especially its Navy. We actually had seventeen members signed up yesterday to go on a carrier embark, which is a good thing, to get those members to see and to make sure they understand what's going on. Another conduit for them is to do a submarine embark. So we're going to make sure that we take them through the

National Defense 101 training to make sure they understand all the challenges that are out there. And they are many.

I told the members that they're going to be faced with some tough decisions as we're in this challenging budget environment. I see that challenging budget environment, not only now, but into the future. It is going to be a challenge for all of us to make sure that we make very pointed and cogent arguments about the importance of our submarine fleet; the strategic importance for this nation; the importance of maintaining that industrial base and the importance of making sure that we continue to attract the best and brightest men and women in this nation to become submariners. That's our challenge.

I think we're up for the challenge, but there will be lots of competition in that realm for those resources. Therefore, I put out to each of you in this room that you are the cadre of experts-whether it's through your experience in the submarine fleet or through your experience in the industrial base—is to make that argument, is to talk to people about the importance, and the importance at every level—the importance to our nation, strategically, to have the submarine fleet that includes our ballistic missile submarines and the modernization that needs to happen there, to continue the two ship per year build for SSNs, to make sure we continue on that track. In this competition for scarce resources, that's going to be our challenge. I want to make sure, too, that people understand why the whole concept of the nuclear triad is important for our nation, why sea-based ballistic missiles are extraordinarily important. We continue to make that argument every day. Sometimes, though, members' eyes glaze over when you start to talk about all these acronyms about ships and D5 missiles and modernization. People go, “What's going on with that.” So what we have to be able to do is to bring it down to the very, very simple level about why it's important for our national security and why that strategic importance lets us keep our economic position in the world. Also we have to explain why the industrial base and the skills that go along with that are so critical, and why if that's allowed to decay in any way, we know what will happen to the ability to build those fantastic boats that we put to

sea—the SSNs and the next generation of our ballistic missile submarines. So it's a challenge for all of us. But I do believe that members are sympathetic to that argument.

I have found that when I go to members and say, "You need to take the time to come in and get a brief on where we are with this nation's military readiness", most members are willing to do that. When it comes time for them to visit and actually take a couple of days out of a schedule during an election year to go to sea, that's a good thing. So we're going to continue to build on that and make sure that members have that opportunity. As you contact members of Congress in your areas, please encourage them to take that time. We are going to continue to put on these briefs about national security, we're going to continue to provide opportunities for them to go to sea. Please encourage them not just to support our submarine programs, but encourage them to understand more about how our submarine programs fit into the full scope of national security. Encourage them to take the time to go to sea not just to understand the great capability in these platforms, but to make sure they get to visit with our sailors. That is really the true value in our Navy. I can tell you, in every circumstance when I brought members out and they've gone to sea and they get to visit our sailors and they get to meet those bright young men and women that are there serving this nation, whether it's the eighteen- or nineteen-year-old that's on their first embark on a submarine or whether it's the eighteen- or nineteen-year-old working on the deck of an aircraft carrier, it never ceases to amaze those members the great asset we have in this nation in our men and women that serve. That's a great story to tell. It's a great way to get them to understand the importance of their job. It's not just about numbers, it's not just about systems, it's not just about numbers of ships, but it's about people. It's about making sure they understand what's important in our Navy, and that is our sailors.

I want to make sure that we continue to have that opportunity, and we will continue to make sure that we make the argument up on the hill about why our submarine fleet is so critical to this nation. Our SSNs as I said are just fantastic ships. I'm always an advocate, too, to make sure that we get our members of Congress

out to our shipyards so not only can they meet our sailors that are there as these ships are constructed but also they can meet our world class shipbuilders that do a fantastic job and that they have an opportunity to go around to the companies, the suppliers that provide the great parts for those submarines, and understand the great technology that goes in there. It's a fantastic story to tell and whether a member of Congress is interested in jobs and the economy, we've got a great story to tell. Whether they're interested in making sure that the long term interests of the United States are preserved, we've got a great story to tell. I believe it's just a matter of us getting out there continuing to emphasize how important our submarine fleet is to the nation. We have to emphasize how important their support is to making sure we maintain that, but also that they understand it's the people element that's important.

It's a very easy story to tell. So I encourage each of you to do that, and I know that you do that in scores. But I will say this, we have more and more of a challenge in the years to come because, as I said, fewer members of Congress have that direct connection to the military, either having served themselves or have a family member that's served. And that's not in any way, shape, or form being critical of those members, but it just puts more of a responsibility on all of us to take the time to make sure that they understand. As I said, the story that we have to tell is a great one, and it's one that sells itself. It's just a matter of putting the effort and the time into making sure that it gets done.

I want to thank each and every one of you for the great job that you do in your service to our nation. Whether it's presently in uniform, whether it's being in uniform in the past, in our submarine fleet, whether it's as part of our industrial base, all of those elements are a critical part of the team that it takes to provide the national security that we need for this nation. And I can tell you folks, it's an honor for me to be able to serve, to be on Capitol Hill, to make sure that I'm at least a tiny part of making sure that our nation is heading in the right direction on national defense, and I can tell you that your efforts here go an extraordinarily long way to make sure that our future remains bright for what we know is the greatest military the world has ever known

defending the greatest nation the world has ever know. Folks, thanks again. May God bless each of you, and may God bless our great nation.

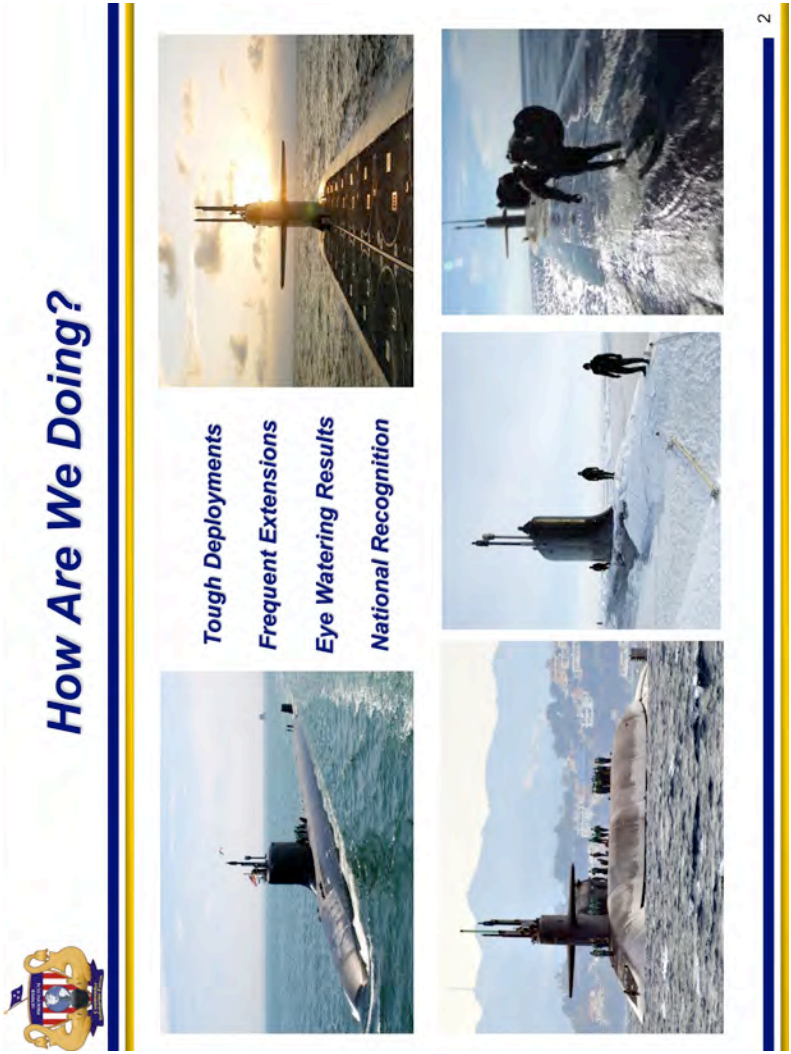
NAVAL SUBMARINE LEAGUE
CORPORATE BENEFACTORS' DAY

VICE ADMIRAL MIKE CONNOR, USN
COMMANDER, SUBMARINE FORCES

I, too, would like to thank all of you for coming here today. You are a huge part of the voice of the Submarine Force. Because we have meetings like this, you know what we're thinking. You know where we're going. You should be able to draw a line between what Admiral Richardson said last night, what I say, what Joe Tofalo says and what Dave Johnson says. And that is—for one reason, it's because we talk to each other. But also, we talk to you, and we do that for a couple of reasons: one, so that when you do your business planning, you know where we're going; also, so that when you talk to people that we can't talk to, that the message they hear from you is somewhat consistent with the message they hear when they come around to a forum in which we can talk to them.

You're sort of like the board of directors of thought for the Submarine Force; and then you branch out. You do your industrial base meetings, and you spread the word there. And that's how I think we circle back and get these guys like Congressman Wittman, who's already on board; and Congressman Courtney's on board. But we help make sure that other policy makers' constituencies touch them with words that sound more or less the same.

So with that in mind, I'd like to talk to this government-industry team about some of the bigger things on my mind today.



Graphic #2 How are we Doing?

I want to start by saying that the Force is doing very, very well. We talk often in terms of how many ships we produce per year and the fact that they're on time and they're on budget, and that's all good. But I want to talk a little bit about to what end we do that. I want to tell you that, as we speak here today, there are about 17 submarines on front-line missions. And I define a front-line mission as their weapon can hit its intended target, should there be a crisis. Their sensor is in a position to collect what they're getting paid to collect this day, and that varies from mission to mission. But there are about 17 of them out there right now, and that number stays about constant with slight variation.

That sounds like a lot of submarines. The truth is there are other battles that rage in Washington outside of the budget arena. There's this whole process we call the *Global Force Management Process*, and that's when all the geographic and functional combatant commanders put in their requirements for how many brigades, aviation wings, et cetera, that they need. We're part of that and they put in for about three times as many submarines as we have. That's almost a given; but that turns into a really tactical fight these days, because there are some incredible seams in where things are going on in the world where these submarines are needed. The big seams are the crossroads of Eastern Mediterranean, Southwest Asia, Africa and the Arabian Gulf. I'm just telling you this is a problem for me, because we did this wonderful thing we call the *pivot to the Pacific*, which says we're going to put 60 percent of our forces in the Pacific. This was for very good reasons, but the truth is that leaves me with the other 40 percent in the Atlantic, servicing EUCOM, AFRICOM and CENTCOM. There are significant things going on every day in every one of those arenas.

What does that mean to us? Well, it means that many of our SSN deployments these days are seven months, some longer. I'm looking around the room here, and there are actually a couple of people older than me in the room. I think about how we all grew up, with our three and-a-half-month spec-op type deployment or our arduous, six-month Mediterranean deployment. Remember

that? Remember that involved a three-week upkeep alongside the tender in La Maddelana where you could sort of reset and fix everything, go to the beach—you know, all that good stuff?

That is not what it's like to deploy right now. We're talking seven-plus months, 85 percent op tempo. Your port visit typically involves picking up a couple of parts and maybe a new sailor in one of these resort places, like Fujairah in the United Arab Emirates or, if you're really lucky, Diego Garcia. I wasn't actually joking, because people say, "Can we please go to Diego Garcia?"

When they're on these missions—some of you remember going to some relatively quiet place in the world so you could learn the exotic thing that goes on there. Today, it is more like we go to some of the busiest places in the world and learn about the exotic things that go on there, and that's pretty taxing for the crew. So, we're trying to carefully manage deployment length, deployment intensity—how intense the specific periods are. How long can you function effectively when you're in one of those busy places doing hard things? Have we delivered the right tools in the form of training, systems and mentorship? So, we can go from the world where the measurement of success was, "Does the entire combat control team get to the right answer?" to one where we're saying, "Does every leg of that stool that holds up the proper operation of the ship on deployment work independently when you pull out the others?"

Just because the captain saved the day, or the XO saved the day, or the CDO saved the day, just coming out okay in training is not good enough. We want to make sure each one of those subordinate stations has the knowledge, has the willingness to stand up and be counted if his picture doesn't match what he knows or should know makes sense, and that they all feel empowered to do that. That's been a big focus. I think it's helping us approach these challenging missions in the right way.

I was here a year ago, telling about some stuff that hadn't gone so well a few months before that. So we've looked at things like what I just talked about. How do people actually interact underway? What is that model? How do we evaluate it? But the other piece is we've done a little more looking, given the intensity

of these operations, into how does the human body perform over an extended deployment in challenging situations. We're evolving to a different cycle of standing watch underway, where we stand longer watches overall; but, in general, barring unique events, the sailors get to actually sleep at about the same time every day. And just having interviewed a whole bunch of guys coming off a long deployment of seven-plus months, this has made a huge difference. And I don't know why we didn't think about it before. You know, we're pretty good at figuring out when the bearing's going to go bad, but we need to think about under what conditions does the individual person lose their effectiveness. Then when we find the answer, just like we do in the engineering world, we have to have the courage to make changes when they're called for. So we've done some of that. So far, so good.

I've only gotten as far as the SSN so far, so let me jump to the SSGN. As you know, we have four of them, and generally two of them-plus are deployed. And they deploy for about 15 months, and they'll do crew swaps at the three-to-four month point, as needed. These crews do their entire certification for their deployments, which involves some pretty tough missions, in trainers, in King's Bay, Georgia, and in Bangor, Washington—a very efficient model. In fact, it's gone so well, that we've decided, when we figured out we weren't stressing the SSN crews hard enough on their pre-deployment training, we would finish all the at-sea stuff we could do. We would play in the busiest traffic we could find within a couple days' sail of their home port which, if you're on the East Coast is not too bad. If you're in Hawaii, you've got to go pretty far to find traffic to play in. So, we bring them back to the trainer to get their truly varsity-level certification so we know that there are no weak legs in that stool. We really learned that by going through the pre-deployment process we were doing on the SSGNs.

So, for those of you looking at the future of high-quality simulation to produce effective crews at sea with the ship, I think we're setting the standard, but there's probably more we can do. But that piece of the business is going pretty well.

Those SSGNs are in great demand, with lots of people competingfor them. The Special Forces want them. The Combatant Commanders want their Tomahawks, and those aren't often in the same place. So. We work that carefully. If you look at the chain of command in the military and in government, I feel like I'm pretty high because I'm a three-star, but the truth is I'm way down there. I'm amazed, because of these SSGNs, how much I exchange personal email with the Director of National Intelligence. That guy and the people who work with him are so focused on the incredible, unique things that those ships can do, and they're doing good work for the country.

Okay. About the SSBN world-absolutely our number one priority. In the ops world, we're getting back to something that many of you will find very familiar. It's called the 70-day patrol. We're tempering our need; our desire, maybe, to look at the ships to make sure everything's okay with the fact that they do their best work when no one has seen them for a long time and they just show up at the appointed place at the appointed hour. And, again, we have probably the world-class deployment certification process going in the SSBN world. It's very mature. Some of you here built it. I think Joe Tofalo took it to a higher level down there in King's Bay, and it's really a finely tuned machine. So, it's all good news.

Graphic #3 Gold Standard

I want to talk about people for a while. It's come up in a couple of conversations with Admiral Richardson and Congressman Wittman. And, of course, there's been a lot of news about the quality of the people who the nation entrusts with its most important work. There are a couple of outside looks going on right now. You've seen it in the press. The Department of Defense is going to take a look at anyone who carries nuclear weapons, or is capable of doing that. The Navy is taking an internal look, which basically we do every two years anyway, so someone's going to see the thing we just did and maybe do some follow-up. That's probably a good process. I am not worried about what we will find because I think our process, by design, has us knowing how we're doing, where our strong points are and where we have to do some work. What I expect will happen is this study will take place, and we won't learn much. If we do, I'll be happy to learn something, but I think we're in good shape. And there's a reason that we're in good shape, and maybe there's a reason that we're in better shape than other people who are in the same business.

Let me just review why it is that I think that's the case. For starters, we recruit quality people. I think Admiral Richardson talked about how some other parts of the government entrusted with high-level missions were sort of picking from the bottom of the class. We pick from the top. Many of us went out to the Naval Academy this week, and we met 135 young men and women who were just selected for submarines, and these are some sharp people. In fact, I'm glad I'm not competing against those people today. They might be up here instead.

Then we invest in their training, and we invest a lot. We invest a year of their lives. We have consciously taken our upper-level people coming off the submarines and put them in the schoolhouses to pass their knowledge on to those who follow behind. And that wasn't a fashionable decision when we did it. The idea was, *no, you need to be grooming those people for, you know, making slides in D.C.* and all those other things we do with our smart folks. I said, "No, we need to pass our knowledge from person to person in the schoolhouses, and we need to invest in the

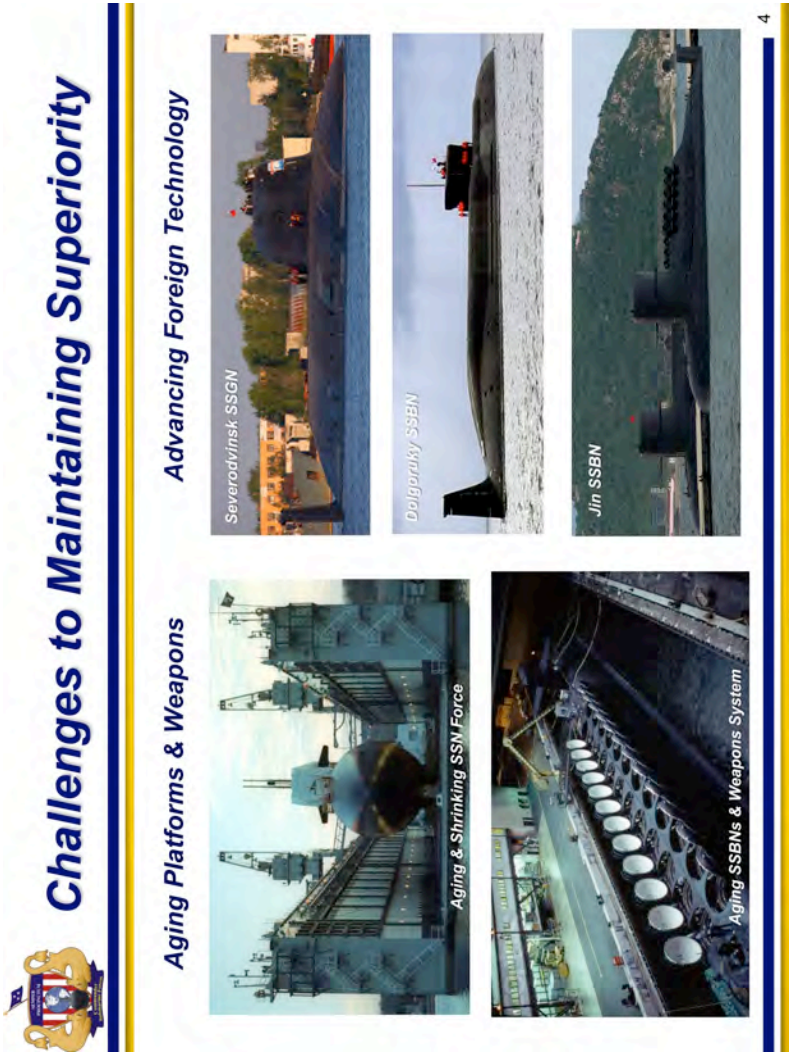
training devices for high-quality simulation and training, to really stress the people." I think that's come up a couple of times.

You have to have a thoughtful curriculum, and look at all the people you're training—officer and enlisted. I'll tell you there's one that I'm kind of scratching my head on right now, and maybe some of you folks here today put us there; but I'll just give you the example anyway. In the forward end of the submarine, we used to have quartermasters and ESM electronics technicians and radiomen, and so it was pretty clear what they were supposed to do based on their name. Now what we have are electronics technicians, and they're sort of good at using the radios, and they're sort of good at electronics surveillance, and they're sort of good at navigation. The problem is you can't be sort of good at navigation.

It turns out in the world we're going into, you can't be sort of good at electronics surveillance, because it's a very fast-moving field as the things that you go up against change very quickly. There's this whole new thing called the low-power broadband radar, which is a very different animal from these crystal-driven things that we used to go up against when we were young, when it was very clear always what ship class and maybe even what ship. It's a different world out there, and we have to have people who are deeply expert in some of these critical fields so that, even over the course of one of their sea tours, as the technology evolves, they can evolve with it. And so we're going to start by getting the people in the right places and making sure that the training supports excellence in their primary mission, even if it makes them a little bit less broad, because we have to have that depth and knowledge.

In the other area of managing people, let's talk about problems. Our mantra here is we celebrate small problems. So, when you find a small problem, you can either ignore it because it's small, or you can go after it because small problems are the leading indicators of big problems. Just like Admiral Richardson said, when they found an issue with the prototype, they're on it, quick to investigate, quick to inform. And when they have all the facts, they'll be quick to act, as required. There was something not

unlike that three or four years ago in one of our submarines, and that's what we did. It was very similar, and we jumped on it. We bounded it. We eliminated it. I'm as certain as I can be that we don't have a wider-spread problem, because when little problems come up, someone comes forward, as they did in Charleston and said, "Hey, I just saw this. It's not right." And we say "thanks," and we go figure it out. That's how we're achieving results; it's with the high-quality products you give us, the high-quality people that we train and that we incentivize to stay in our business, because it's a good business to be in.



Graphic #4 Challenges to Maintaining Superiority

But we have some challenges, and I want to spend the rest of my time talking about things we need to fix, as opposed to things that are going pretty well. So, our first problem is our force structure and the side effects of the way we got that force structure and the rate at which we're recapitalizing it.

I think you probably all know we delivered our last Los Angeles-class submarine in 1996. We delivered our first Virginia class in 2004, and we built three submarines in the interim. We're now in this world where we are meeting the demand that I talked about before with a declining number of ships because the build rate—even though we're thrilled about this two ships per year—does not match the retirement rate of the force as the ships that we built during the Reagan buildup go away. So, when people like Admiral Richardson talk about not compromising your standard, one of the standards that I can't compromise is doing business right with the number of ships we have and not attempting to deliver more forward presence than possible. So, maybe we'll just have to start saying, "The number is this," and let the Joint Staff figure out where they go.

But it's not just the numbers; age matters. We're going through a process. We have extended the lives of some of our ships; in the case of the Tridents, by a flat 12 years. In the cases of the Los Angeles class, by some smaller increments. It varies a little bit ship to ship. We've done it carefully; I'm not saying we cut any corners. Also, based on data, we have extended the interval between some of the major availabilities—the depot availabilities—so we can get more forward-deployed time out of those ships. Again, good thing, right idea, data-driven. I'll add one more thing. We have a maintenance plan which is geared to make sure that we find any problems we have before they become limiting or dangerous for the ship. All good.

What the difference is now as ships get older is that when you do the periodic inspection to make sure the wall thickness in this tank is greater than X, sometimes it's not. In fact, a lot more times than in the past, it's not. I think the piece we didn't fully realize is the amount of work needed to get it back to the standard it has to be so that you know before the next extended inspection interval

everything will be okay, we're having to do a lot of work. And that leads to one of the fundamental facts that I want all of you—especially you in the shipbuilding or maintaining business—to walk away with, and that is we do most of our depot maintenance in the public shipyards—the Naval shipyards.

If you were to take the notional amount of work that is required to turn those ships around and get them back in the predicted time, they flat-out don't have the manpower in their shipyard to do that work. They don't have it. Then add to that the fact that the delta between the notional and the as-found condition when they show up is widening a little bit, which adds churn. So, we have a capacity issue.

It's frustrating for me when I see a shipyard that I need to use, that has a capacity issue. And a capacity issue always turns into a priority issue. Just put yourself in a situation where you're an attack submarine competing for limited resources against an aircraft carrier and a ballistic missile submarine. It doesn't take too much to figure out where you stand in that scheme—for lots of good reasons, but that's where you stand. The shipyards—the public shipyards—need more capacity. They need that at a time when it appears to me some of the private shipyards, as they go through their ebb and swell, are hiring or they're laying off because they have to balance a workforce to maintain their industrial capacity. There seems to be a need to figure out how to make all this come together. And if people sit on the side and say, "Well, I can't do anything about it from here because of this rule" and "I can't because of that rule" I just want you to know, the guy that loses is me. Okay? And the types of things that I lose are important. I put an SSN in a naval shipyard for an 18-month, notional depot maintenance period; and it will probably come out 28 months later, and there's nothing that the ship or I can do about that. But there are some people in this room that could.

So, when you do talk to someone like your congressman who's on the Readiness Subcommittee about what could they do to get more value out of these very good submarines they have, they could do that. They need to help us have the resources to get that

last tactical mile of a ship they spent a lot of money building. And it's also a way to ensure our long-term industrial base is viable.

Okay. On to the SSBN world. As you know, we've taken a ship with a 30-year life and a weapons system with a 25-year life, and we've extended the ship to 42-years. And then we're modernizing the missile system—it's just brilliant engineering going on there. But we're doing that, and it's tough, because we're doing that while we're maintaining the availability of the ships for their STRATCOM mission. It's easier and more efficient to do the required upgrades to the combat system outside of a depot overhaul-type period—at least for the group that's doing it. But I think we need to start looking at the net availability of these highly valuable ships. We may need to start pulling some of that stuff into the shipyard availabilities so that we have more days at sea when they're underway.

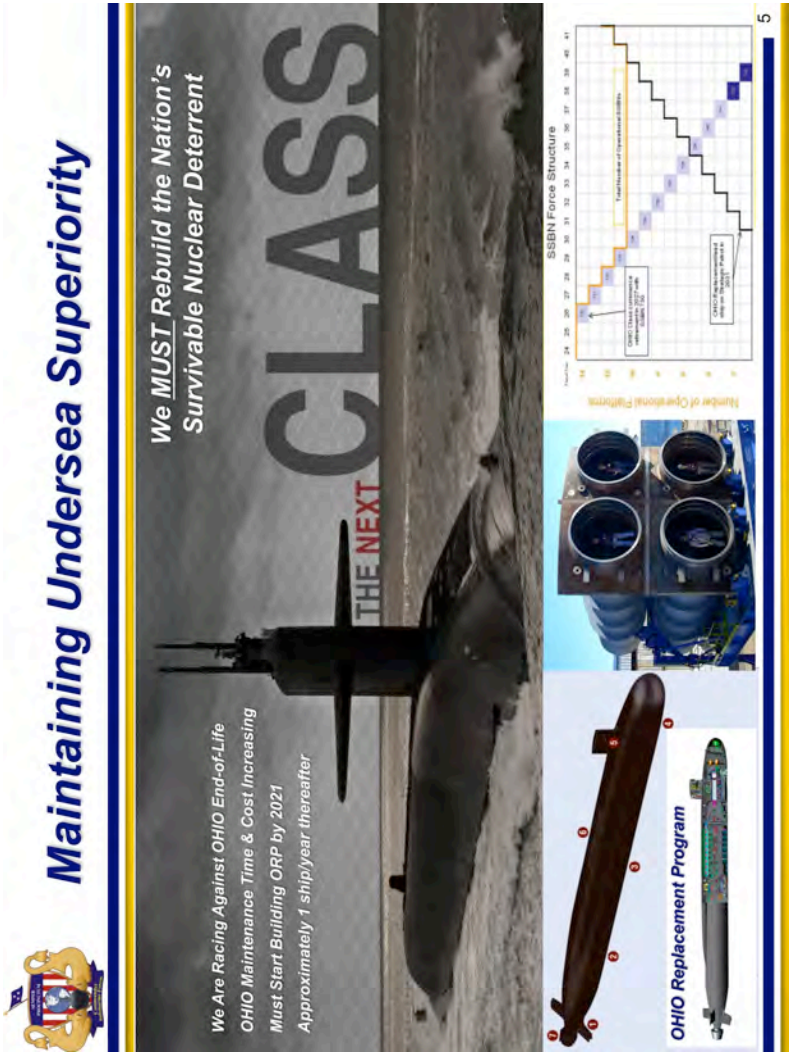
If you look at the probable competition, while we're getting older and working harder on maintenance, the adversary is evolving, too. They now have this Severodvinsk submarine. It's the latest and greatest from Russia. You know it's the latest and greatest. It is about 18 to 20 years in construction, but they've fixed that. Then they'll go from 18 years, probably, to three years, to two years, and they're going to build a lot of those things. They have all the appearances of a very well thought-out submarine that has a lot of cruise missiles that we'll probably be seeing in an ocean near you sometime in the next couple of years. We expect it to be quiet. We expect it to have significant weapons capabilities. If we're going to maintain our qualitative dominance head-to-head, this is probably the guy we need to maintain it against. So that will be a focus of our undersea superiority.

Similarly, there is the new Russian ballistic missile submarine. They're in production. They've got two delivered right now with more on the way. They are back in business, and their concept for their strategic deterrent is very similar to ours, and they're serious about it. They know that it is a vital part of their national security and their ability to have influence in the world. And it's important for us to know that they know that. And it will be as important to

us in the future as it was in the past to ensure that they never achieve the type of survivability that they seek with that system.

Then there is the new Chinese SSBN. They also have two delivered and many more in construction. I don't think they're going to be the most sophisticated submarines in the world, but they're going to be out there on continuous patrol and will bear watching and will give us something else to look at.

My point is we can't satisfy ourselves that we're doing the right thing by simply maintaining the status quo or declining at a slower rate than the rest of the Department of Defense. The Department is putting a lot of eggs in this undersea superiority basket. We have the technical capability to continue to dominate. We have the people who will have the ability to dominate, given the right tools. And that's kind of where we stand.



Graphic #5 Maintaining Undersea Superiority

In fact, I would go so far as to say that we are doing all we can right now with what we have today. And what we do in the future will be a function of what we have to do it with. So, when we talk about recapitalizing the force, as we're going to talk about for most of the rest of the day, I'm telling you that will have a direct bearing on whether we're still talking about undersea superiority ten years from now.

Let's start with the SSBN, unequivocally, the most important mission in the Department of Defense. And we ought to be able to talk about it in that simple term. That's how I talk to my people. When I go down to King's Bay, and I talk to the sailors on the BNs, I thank them for what they do. I explain in terms not quite as eloquently as Admiral Mies, perhaps, but how this platform, along with a couple of their Air Force counterparts, has been responsible for the fact that there's been no major-power war for 69 years now and counting. It's because of what these people do every day. And I tell them, "Don't feel bad that you weren't in on the Tomahawk strike, or the hostage rescue, or whatever it was that your neighbor's been involved in. You're doing the most important mission. And the fact that some of these small-scale things are even newsworthy—they're only newsworthy because you've kept the background noise down from what you do every day."

And we can't let the public forget that. We can't let the crews forget that. We had a little allusion to how the Air Force was motivating their people on the missiles. They're doing the same thing. I don't think they were talking to their people the same way. Then there are other things you do to show people how much you value what they do besides talking to them and maybe besides their reenlistment bonuses. It turns out that the younger guys who work for you read the budget, too. Okay? So, if you're a missile guy, for example, and you say, "Well, you know, I just don't see a lot of future in this," and your boss says, "Oh, come on, son. You know we care about you. This is important work." Then they say, "Well, I'm looking at the Air Force budget, and I just don't see where this system exists after, you know, Year X." Fortunately for us, we don't have that problem, but we need to make sure we never have that problem. And we need to make sure that the nose of the

camel doesn't get under the tent on that problem for us, and it tries every year.

We lost a couple years of production on Ohio Replacement a couple of years ago because there was a good idea that said, "I think we're going to be okay. Let's just wait two years." Those days are over. I'd like you to sort of look at that chart in the lower right. There are two charts. One is the demise of the existing Trident fleet as it times out for hull life. That chart is a guarantee. Those ships will go away. We've done everything we can. We're out of tricks. There is no margin. In order to sustain the standards we must, we will not operate them past those dates. Done. The build-up slide is the track that we're on for going on mission on Ohio Replacement, and we are—and you'll hear more details about this later, but we are basically two blocked with all the things we have to do to design and build and test and get on that patrol. Therefore, the number of ships we have doing that mission is also depending on the buildup chart; and we will either make it, or we won't. If we don't, the credibility of our deterrent will be severely impacted, with all the bad things that follow. Mainly on the international stage; secondly, the belief by the people doing the mission and the mission that they're doing. This is important stuff, and we can't let it go.

It's important to make sure that the Senators and the Congressmen know what the requirements are, and it's important that the E-6s and the O-3s on our ships know that we're preparing the way for their future.

Graphic #6 Maintaining Undersea Superiority-Remain Focused on Future SSN Force

We talked about maintaining undersea superiority against the qualitative threat—the Severodvinsk and what would follow her. Here's the plan for that. I think we're on that plan. One of these weeks, we're going to hear about this ten-block buy that's almost a done deal. We heard last year about how we're going to make the Virginia class better starting in FY '19. We're also looking in that same time frame at taking the sonar systems to the next level so they will have more margin as the adversary gets better. Then at the bottom, we're looking to make these ships more versatile, carrying a variety of payloads for those larger ocean interfaces they'll get with those payload tubes, and just getting a little bit more creative about how we employ them.

Graphic #7 Maintaining Undersea Superiority-Invest in Future Weapons and Payloads

The last area I'm going to talk about—and it's not quite as suitcased as we have our shipbuilding programs. I want to talk about our weapons and our payload programs. I mentioned the D-5 life extension already. Again, SSP is doing a great job with that, but they depend upon a national infrastructure, and the weapons business and the rocket motor business—it is not real healthy. And so we need to look at that real hard. We'll be good through the transition to Ohio Replacement, but we really need to look at what happens as we go on.

The industrial base has taken some major hits. You know, you're probably aware that we kind of rode on the Space Shuttle's solid rocket motor consumption, and they paid a lot of that overhead. And that's gone, so now we pay most of the overhead for solid rocket motors in the country. There are also all kinds of things in the guidance area, where Terry Benedict and his guys are really working hard just to make sure we keep enough people who know how to do this incredibly difficult, unique work on the team.

On the right there, you see the venerable ADCAP torpedo. It's a great torpedo, but it's getting a little old. A couple of data points: I spent most of my career training for the auto fuel spill that never happened. I've had more auto fuel spills in my tour at SubLant than in my entire career prior. Maybe it's just a leadership issue. I don't know. But it does have to do with things like old fuel tanks and that sort of thing. The point here is we have done great things with this weapon. We've had this APB process to keep the front end fresh, but at some point you've got to get a new hull. So we're starting down that path. Joe Tofalo will talk to you about that later. We're going to go down that path so we can recapitalize our inventory, but also to use the fact that we're back in production to get much more versatile on what we do with the weapon. There's a lot of potential out there. Some of you guys know that. We want to turn this into a much more autonomous, much longer-range weapon in the future, and we're putting together some teams to do that.

In the lower left, the Tomahawk. Again, a pretty good weapon, well-tested in war. We stopped using it at sea a long time ago because we didn't have command and control at those 300-

mile ranges to make sure we hit the right target. All we knew is that we would hit a target. But we're much better than that now, and if you take the fact that we have this unique submarine ability to operate almost anywhere in the world, and you want us to turn that into the ability to influence almost anywhere in the world, we have very firm influence control with our aiming and torpedo range; but the country needs us because sometimes we will be the only U.S. military asset in a thousand miles that can stay there as long as they want. They need to extend the range at which we have effects, and to do that we need more missiles, and we need missiles that can attack targets at sea.

Lastly, there are a lot of things we can do in the road to war in the phase zero period that gain even more knowledge for our national decision makers than we gain today, that can have more influence as we interact with the electromagnetic spectrum of potential adversaries. We can do that better, longer, and we can do it even where we don't have submarines, if we use our submarines to put other payloads in places where only we can get them. And I'm talking about unmanned, undersea vehicles. In some cases, I'm talking unmanned air vehicles.

In closing, I'd like to say the Submarine Force, in my humble opinion, is doing a very good job of pursuing the nation's strategic priorities. The nation's priorities are shifting to ones that line up very closely with our mission. I'll also say, as I alluded to on the SSBN slide, you can say what your strategy is, and people will watch you; but I think Caspar Weinberger taught us a long time ago the world will recognize your actual strategy as being what you actually invest in—not what you say. It's what you invest in and what you do. What we're looking for is a commitment by our country to invest in the strategy that they're announcing, to pursue the things that we feel we can deliver better than anybody else.

And with that, I'll take your questions.

Question: Admiral Conner, on Puget Sound, as you know, we have our SSGNs and SSBNs up there. The Virginia Payload Module is an exciting tool to help overcome the replacement of our Tomahawk capabilities on the SSGNs, but I'm curious. What are your plans, or what can you share with us? How can we help you on your future to replace and to extend that range from Tomahawk? What's next?

Answer: We're making a case to extend based on that Tomahawk capacity alone, and it's a good case. But we're building the system with the ability to carry a variety of payloads. It might be undersea vehicles. It might be a different type of missile. There's a huge interest out there—it's sort of defense policy/academic-level interest—in the impact of a conventional prompt-level strike weapon, which that ship could easily deploy. And what they're looking for is the ability to conduct conventional strikes at ranges of a couple thousand miles in about 30 minutes. That is imminently doable, and that puts some significant power in the hands of the President to deter and dissuade people very quickly using a conventional weapon.

Question: Ron Morgan, from Raytheon. You've already answered part of my question, and it's somewhat related to Guy's. Investing in payloads and weapons is certainly one of your consistent priorities, so payload development is. You've identified some areas, like prompt global strike and others and ASUW, as very important. There are other areas where industry obviously has limited resources, like everybody else. There have been things like subsurface-to-air. At one time, it was called a *Submarine Littoral Warfare Weapon* and all that. If you can in your own mind, maybe, give us some priorities. Number one might be ASUW. Number two might be Prompt Global Strike. Number three might be unmanned vehicles. If you can give us a little bit more peeling of the onion, I would appreciate it. I think it might be helpful for us to figure out where to invest.

Answer: Sure. I would say number one is the ability for submarines to reach out further using the command-and-control and targeting tools that exist today. I would put in that category some type of multi-mission tomahawk and a longer-range torpedo. What we get out of that is the ability to influence directly the greater field around the ship. The other thing that I'm a big believer in is that we get a chance to leverage the adversary's paranoia. You know, when you have that advantage where they know you're there but they don't know exactly where you are, they know that they don't know where you are, and they know that you can attack them at any minute, that changes their whole concept of how they fight. And that requires them to invest heavily in defensive systems and data networks. It requires them to radiate on their sensors a lot. And sometimes when they do, we gain more from that than they do. And it requires them to commit a good portion of their weapons battery to self-defense missions. And then, when we get them really paranoid, that gives us the ability to, maybe with the right payloads, make them see submarines on their systems where they are not. That is a very cost-imposing strategy that we can put on them. And that's really where I'd like to be - is to use things to sort of turn the table on who's imposing cost on who.

That's where I'd like to start. There are a bunch of other things we could do. You know, we can't do all of them. I can't complain too much about the fact that we put the short-range, surface-to-air missile on the sideline, because if I did, Dave Johnson would run up on the stage and say, "But he's the guy who did it." And we made that trade one year. It was on the margin. We had to do some other things, so we kind of stopped testing where it was.

But that leads to the other thing. What we really need and what I hope will come out of this blue-ribbon panel that Joe Tofalo's putting together is we can't hope to get to a robust weapons and payload machine, so to speak, unless we have year-to-year budgets that are big and that are like what they are for shipbuilding. When I look at you and, I think, you look at me, you probably say, "Okay. Hey, how big is the budget line going to be; and what are the chances that if I compete, I win?" I think that

some of you, when you take your version of the decision paper to your CEO, say, "You know, I think we can win this. We've got a 30 percent chance of winning it." And then they'll say, "Yeah, but those guys haven't put the money there yet, so I don't want to spend money to win something that small."

We are trying to change the calculus on that. This is not the most opportune time in history to be trying to do that, but we're working on it, and the fact that the country's trying to rely heavily on the undersea domain will help us make a better case. But that's sort of what we're doing.

Question: Admiral, since, arguably, the greatest existential threat situation for the U.S. is as naval conflict in the Western Pacific, would you envision over the next decade or so the writers of tactics and doctrine, like DEVRON or COMSUBFOR, or even Commander Fleet Forces moving to the Pacific?

Answer: I don't think so. We've done a good deal with putting our forces in the Pacific, and we end up going to San Diego a lot so that the Pearl Harbor guys and the East Coast guys can get together when we need to meet face to face. I think there are problems with doing that. For example, I work out of Norfolk. There are six submarines in Norfolk and a bunch in construction and overhaul. But the value I get from being in Norfolk is I can walk across the street and talk to a fleet commander, which is very helpful. It's helpful when you're trying to make a point on something, and I do a lot better across his desk than I do on a telephone. It also helps to get up to this town, where we have to interface a lot to get things done.

A whole bunch of our intellectual capital in the undersea warfare business is on the east coast. We've got the construction yards here. The Navy Undersea Warfare Center is here. So, we have a pretty good center of gravity here. In my opinion, if we were to try and pick it up and move it based on the geographic threat of the day, we'd spend a lot of time moving. You know, I got up this morning and read about the massive, unannounced Russian exercise on the Ukraine boarder. I thought that was

fascinating, because the last time I remember a large, unannounced military exercise was in 1990, and it was the Iraqis assuring us all "this is just a war game." Some of you might remember that.

We're a mobile force. We can go worldwide. I think there's a lot of churn associated with moving headquarters and lives and that sort of thing, so I don't see that happening.

RADM Padgett: Admiral, thank you very much. One of the points I took from that is a new metric for leadership. How do you tell a crew that they're going to spend seven months deployed and make them happy about a liberty call in Diego Garcia? The fact that you pulled that off, Admiral – I've got to tell you, that's leadership at its finest.

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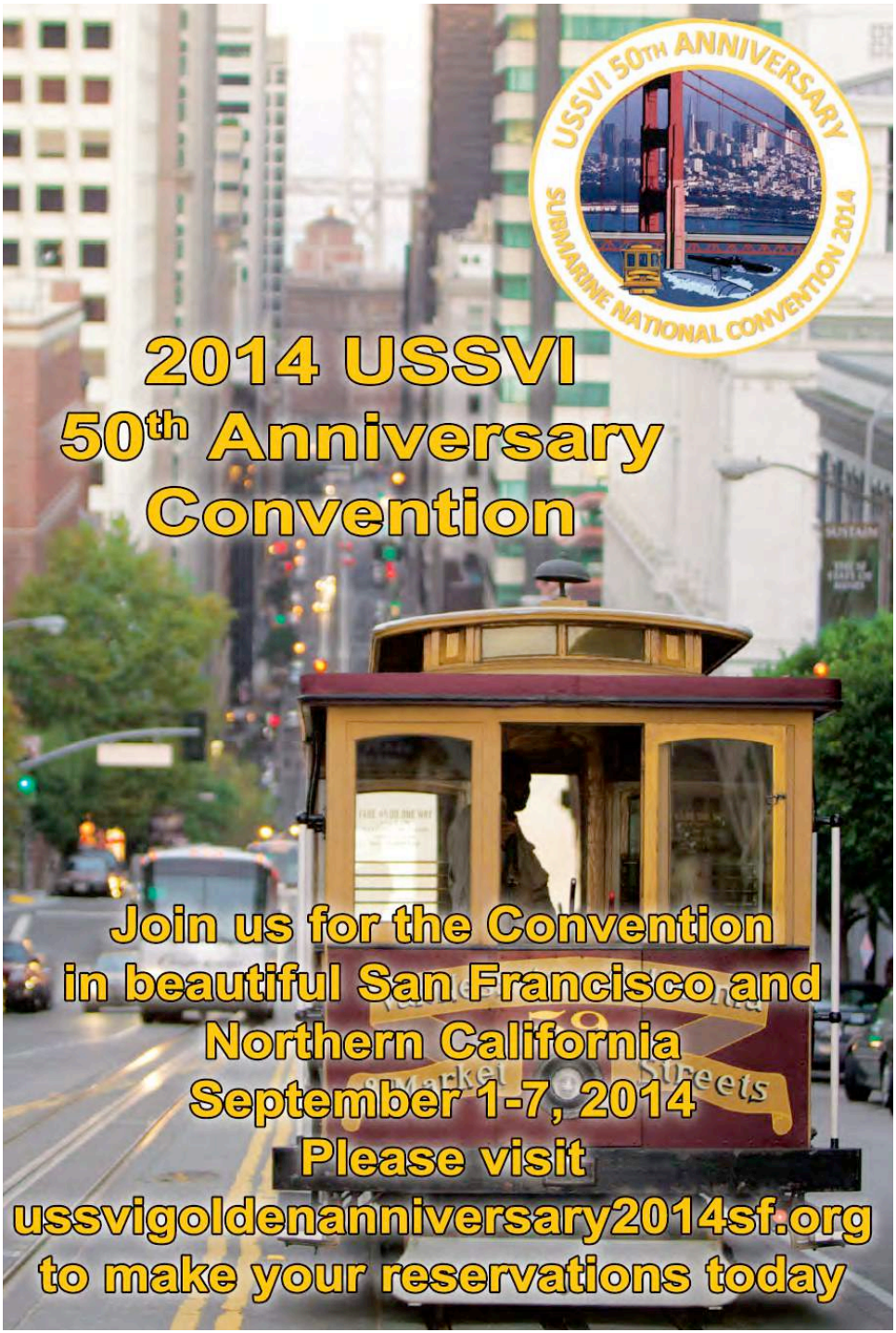
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RDML Joe Tofalo, USN
Director of Undersea Warfare, Office of the CNO

RADM John Padgett: Our next speaker is here for the first time in his current assignment, and those of you who have been regular attendees at this event might say, "Golly, that position seems to be rolling on a fairly regular basis", and I would agree that has been the case. But two things have been very consistent about the N97 position. One has been the quality of the officer that's in the job. Their pedigrees have been exemplary, and their contribution has been aligned with what is best-needed at the moment in the Pentagon. Secondly, I think the intellect and the intellectual integrity of the individuals who have been in this job for the last couple of years has been singularly outstanding. Admiral Tofalo comes to us from Submarine Group Ten. He commanded USS MAINE, so he is intimately involved in the Ballistic Missile Strategic Deterrent mission. I think that, with Ohio Replacement being the top priority of the Submarine Force, having someone who is as eloquent and well-informed as Admiral Tofalo on the Ohio Replacement issues, I think, is a big plus for us. So, it gives me a great deal of pleasure to introduce OPNAV N97, Admiral Joe Tofalo.

Admiral, thank you very much for that very kind introduction. It's an absolute thrill to be here and an extreme honor. I am extremely humbled by this opportunity to serve the Submarine Force in this capacity.

My goal this morning is to give you a notional fix, if you will, of the Submarine Force. Also, over the course of this conference, we'll clearly be talking about some of the significant challenges facing us, so, I also want to give you some of the good news.

There were rocks and shoals that existed last year; many people are very familiar with them. It was a year ago, the 1st of March, 2013, that sequestration became the law of the land in the Budget Control Act. That took $21 billion from Navy TOA in FY '14 and '15, caused a 16-day government shutdown and the furloughing of approximately 650K government civilians. Imagine the challenges that created for somebody like Admiral Johnson and Admiral Jabaley with a workforce that is trying to do what they need to do to maintain our submarine programs.

There was an extensive Continuing Resolution and then the mini-deal, the Bipartisan Budget Agreement. That was great from the standpoint of the relief that it had, but there was churn there, too. We did the POM-15 budget for a fourth time as a result of the Bipartisan Budget Agreement. It's good news, but it does cause churn because you want to get it right. You want to make sure you re-balance in a way that is appropriate and most effective.

Of course, the Washington Navy Yard shooting challenged, again, Admiral Johnson and his folks. That was no small thing to work around. The decommissioning of USS MIAMI was a bitter, bitter pill to have to swallow. Additionally, there are all the external threats that Admiral Connor referred to in his remarks. The SEVORODVINSK SSGN-you know she's got an eight-pack in her VPM-like module, if you were counting them there on his slide. DOLGORUKY SSBN, there are two of those. The Bulva class SLBM is being tested. The Chinese have the SHANG-class, the JIN-class, and the JL2. When you roll it all up together, there are two countries on the planet that have two new SSBN submarines in the water and are testing a new ballistic missile, and neither one is the United States. Those are some external threats that we have to worry about, and when you combine that with last year's events that I just mentioned, it's very, very easy to be skeptical.

If we take a fix and look at our current position, as Admiral Connor told you earlier, there are a lot of good things going on in the Submarine Force. Admiral Richardson also said this last night; there are good things to take stock in. You cannot deny the fact that at the end of last year we landed on our feet. Ohio Replace-

ment: fully funded at $1.1 billion in FY '14. D-5 life extension: fully funded with $712 million in FY '14. Virginia class: fully funded with $6.7 billion in FY '14. VPM: fully funded, $59 million in FY '14. The Virginia-class program and the Ohio Replacement program are the second and third-largest acquisition programs in the Department of Defense; second and third only to Joint Strike Fighter. That is good news, especially in light of the environment; the soundings, the potential shoals.

During the year, one sub was commissioned, and another was christened. Nine submarines are in some aspect of construction. USS MINNESOTA was delivered eleven months early. That's absolutely amazing. We've got NORTH DAKOTA coming very soon behind that, on-track to also be ahead of schedule. When you consider she's the first of the Block III's, which is essentially a 20 percent design change in the bow and VPT, that's absolutely eye-watering. My hat is absolutely off to Admiral Dave Johnson and his team for what they do. There are a lot of people in this room who are also part of that team. And, of course, Admiral Connor alluded to the Block IV contract, which is imminent—the largest shipbuilding contract in history.

So, again, a fix. Some tough times there in the year prior, but certainly a lot of great things that we should be very, very proud of, and happy for, given the potential for other results.

Let's talk about an obvious question you may have, "Hey new guy, where are you coming from?" Many of you know me personally, probably 60 percent of you. I think at least 5 percent of you wrote a FITREP on me at one time! But just so it's clear, the orders to the helm remain the same. We absolutely must have an uninterrupted, survivable nuclear deterrent. This is the Navy's number one priority. You hear Admiral Greenert say that all the time. The President himself has said that as long as there are nuclear weapons the United States will maintain a safe, secure and effective nuclear deterrent.

Admiral Richardson talked last night about essentially deputizing everyone to go out and speak the good word when it comes to our programs. So let me remind you of some pertinent statistics to pass on. Right now, as we sit here today in this room, the

United States Submarine Force is responsible for approximately half of our nation's deployed nuclear warheads. And if that alone doesn't impress you, what we're saying is the other two legs of the triad combined are essentially equal to the United States Submarine Force by itself. Frankly, they're a little bit less, combined. Ours is a force that is made up of about 8 percent of the Navy's Officers Corps. There are more doctors and dentists in the Navy than there are submarine officers, so it's very highly leveraged. As an American taxpayer you should be absolutely thrilled about the return on investment you get when it comes to the sea-based strategic deterrent.

In addition, although we're about 50 percent now, under the New START Treaty, that number approaches approximately 70 percent. 70 percent of our nation's deployed nuclear warheads will be on United States submarines. That is a big number; we have got to get this Ohio Replacement Program right. We have wrung every single ounce, every single efficiency out of the program. We have got to make sure it is uninterrupted, as Admiral Richardson and Admiral Connor have both said. You saw Admiral Connor's little stair step chart. If you counted the blocks, it'll be five Ohio class ships that will be gone away before that first Ohio Replacement comes online. Again, we have got to get this right. We have wrung every efficiency out of it. We went from 41 to 18 to 14 to 12. We went from 24 tubes to 16. We extended the service life from 30 to 42 years, so there's 12 years as a first increment between classes. When you go from 18 to 12, that's another 6, so now you're at 18 years. And then you add in the two-year delay that we had, that's 20 years. That's why we're going to 2031 instead of 2011. That's the 20 years when you add it all up, essentially; because when that first Ohio got underway in '81, we thought that 30 years later, in '11, we'd be doing that next patrol on the next submarine—Ohio Replacement submarine.

But it's going to be 2031. To do that in '31, you've got to start construction in '21. Everybody gets that ten-year period: seven years to build one, then load it out with weapons and certify—that all kind of makes sense. But it's that time between now and 2021 which some don't seem to understand. In some circles there's a

sense that people just think we can kind of pull an all-nighter in 2020 to get it done in 2021, and that's not the case. That's why we have all that R&D that I just mentioned up front. We want to achieve a goal of over 80 percent design complete in order to make sure that everything else can happen lockstep. This is a ship that's two and-a-half times the size of the Virginia-class; yet, we're going to build it in approximately the same amount of time. So, we're making those investments up front now. The country has spoken. The administration has spoken. So, now it's our part of this to make sure we get this Nuclear Deterrent right.

Our second priority is the Virginia-class itself at two per year. The President's Defense Strategic Guidance says that we must maintain the undersea capability to ensure access to anti-access/area denial environments. To do that, we must have the force structure that gets us inside where we need to be. As Admiral Connor was explaining, the things that we're expected to do on day one of several conflicts is a long list. We won't be able to do that if we don't have that access. Two per year for the Virginia-class is a big part of making sure we have the force structure needed to do that.

Again, some education to make sure you're fully deputized to go out and spread the word. Our minimum SSN requirement is 48. We will go for approximately 11 years, from 2025 to 2036, with a force level below that minimum. We'll drop to 42, unfortunately, in 2029, per the shipbuilding plan of record. Virginia-class production at two per year obviously isn't going to fix that, but it will mitigate the problem. Unfortunately, between '91 and '98, we only built three submarines in this country. That's a far cry from Admiral Richardson's remarks last night about how we built 70 in the first 12 years of the program. And I think if you check it, it was between, like, '55 and '70 when I think we built 90 submarines in this country. Wow! The people in this room understand the challenges there, and we're firmly committed to make Virginia-class two per year our number two priority.

Our number three priority is to deliver the payload capacity and the payloads to address future global security challenges. Virginia Payload Module is obviously the centerpiece of that.

We've got to have it. Our target in 2019 is to have the Block V VIRGINIAs start with VPM. It's absolutely crucial to make sure that we mitigate the 60 percent reduction in undersea strike volume that we will have when the SSGNs start to retire. All four of them go away in a three-year period in the late '20s. That's a 60 percent reduction in strike volume. VPM is not going to cover that whole 60 percent. Again, it's to mitigate it. That's why we've got to have VPM. It's crucial and it's cost-effective. You get greater than a three-times increase in the strike capacity of a Virginia-class boat (12 to 40 TLAMs), for less than 15 percent of the cost of the submarine. That's return on investment. That's a good deal, and as of December of last year—it is now a JROC—Joint Requirements Oversight Council validated requirement. So, we have a JROC-signed CDD on VPM. And I think it's fair to say that the Virginia-class submarine is the world standard. But I'm not kidding myself that we don't have to evolve to make sure we stay apace of the threat. And we'll talk about that a little bit more when I get into payloads.

Finally, I want to say that the Integrated Undersea Future Strategy, which was conceived by Admiral Connor, Admiral Bruner and Admiral Breckenridge, remains in effect. I do see some point in my tenure, the need for what I'll call an adjustment for *set and drift*, making sure that it's consistent with Admiral Connor's Undersea Dominance Campaign Plan, which is full-spectrum, all maritime platforms, all capabilities. So, that's just something that I am thinking about. But the IUFS is a solid navigation plan, and we're on track here with these orders to the helm.

The area that has my greatest attention beyond the top three priorities of ORP, Virginia two per year and VPM would be as it says on this slide *influence beyond the platform*. This includes both unmanned undersea vehicles and weapons. Like Admiral Connor said, I would prioritize something beyond the current heavyweight torpedo—and we'll talk about that here in a minute—as being our very highest priority in that whole kit that he was talking about.

We are counting on UUVs in the future to supplement our manned forces and extend our reach. UUVs are key to the transition from a platform-centric, undersea dominance approach to a domain-centric, undersea dominance approach. Their missions include ISR, indication and warning, undersea sensing, mine warfare, deception, lethal and non-lethal covert effects; the list goes on.

For those of you that don't know about it, and I'm sure there are people in the room who know a lot about it; Project 1319 is a Remus 600 vehicle that did its third successful at sea demonstration last March. It had seven out of seven successful captures, two full mission profiles, excellent acoustic comms and tracking performance. I think it's fair to say that this is a proven capability that's now in the fleet commander's hands. Stay tuned for real-world applications of this ability. It's very, very exciting stuff.

Admiral Connor, next has some Undersea Rapid Capability Initiatives that we're also working on. What Admiral Connor is doing here is absolutely fantastic. He's reaching across the S&T gap and pulling things across in a manner that is trying to get stuff out there faster. The goal for all of his projects is less than two years for getting these out to the fleet. Some of those include taking that same 1319 type vehicle, putting it in a TLAM capsule, and now every submarine is a UUV-capable platform; a pretty ingenious approach. There are six total Rapid Capabilities Initiatives. I won't go into all those, but there are some near-term things that we're working hard to find ways to fund and make happen.

Heavyweight torpedo production restart is one of the things what Admiral Connor alluded to. This has the highest priority. Now, first things first. I've got to hit the inventory objective. We have a 30 percent in our submarine heavy weight torpedo inventory. As much as I'd like to build a super modular torpedo right now that would just be the greatest, we don't have the time for that. Frankly, we've got to get the bullets on the shelf needed to satisfy the inventory requirement, and the heavyweight torpedo restart is the approach to doing that. The MOD7 ADCAP is a great weapon, but there are parts of it that are the same weapon that

many of us shot our whole careers. So, we've got to get after that. I know I've got to do that faster so that we can get to the modularity piece that is really needed to take it to the next level.

Admiral Connor alluded to a panel—a review panel—that we're putting together. It is the Heavyweight Torpedo Restart and Future Modular Undersea Vehicle Review Team. I know that's a mouthful, but Admiral Johnson and I are going to sign a charter here this week to get that team going. They're chartered to ensure that we are restarting the line correctly, and more importantly, to ensure that we get the future capability needs right and the associated weapons requirements right. This includes all aspects of technology; taking advantage of a technology push; current S&T investments that are out there; leveraging off the lightweight torpedo work; and, of course, modularity.

There are a lot of efforts that are going on out there. ONR has their extended-range MUHV FNC, Modular Undersea Heavyweight Vehicle Future Naval Capabilities. They have another FNC for alternate ASUW. They have another FNC for fusing. DARPA has their Blue Wolf extended-range propulsion project. NUWC and Penn State are working on one of Admiral Connor's four Undersea Rapid Capability Initiatives. That's Team Number Four, where they're working on a SCEPS engine-type propulsion system, advanced payloads, and also some comms and advanced navigation aspects. So there's a lot going on that we need to bring together, Admiral Johnson and I are looking to this panel to help us do that, and to get the heavyweight torpedo restart under way so we can hit the objective. Also with those great minds, we need to look into the future and leverage all the other things to ensure we build the right weapon for the future.

Submarine and Special Operations Forces also have a lot going, and we are very excited about it. First off, we want to extend the dry deck shelter with a 50-inch extension. This does a couple things for us. One, it gets the diver out of there, because right now all the launch and recovery operations are diver-assisted. Extending the dry deck shelter allows us to automate it: automatic door, automatic tray. It gets the diver out of the loop at a very tactically vulnerable time for the submarine. Those of you who

have done those kinds of operations know exactly what I'm talking about.

In addition to all that, because it's longer you can handle, ultimately, a longer UUV and a longer SOF vehicle, but also a larger diameter, because the diver doesn't have to be part of the equation. So, better bore size, better length—all better.

We want to make sure that's compatible, both, with the SOF SWCS vehicle, the Shallow Water Combat Submersible; and also, ultimately, with N2N6's; LDUUV, Large Diameter Unmanned Undersea Vehicle, which is the program of record. It can be a little bit confusing because ONR also has a LDUUV Innovative Naval Prototype—number 3 was in the Pentagon parking lot about a month ago. They are different vehicles. So, that's kind of where I see that going for the near term.

LDDUV integration with Virginia payload module obviously is going to be further down the line. What we want to do there is get ULRM off top dead center. It's been challenged from a funding perspective. I'm very confident, and I'm pushing hard to get a demo for ULRM, Universal Launch and Recovery Module—for those who aren't familiar with that acronym—in the spring of next year. It'll be on an SSGN, because that's what we have set up. For the long term we'll focus the future of ULRM on VPM as the vision, because VPM is the future of our Submarine Force. When the SSGNS go away in the mid- to late '20s, we want to make sure that we have a future for UUV from VPM that has legs. So, I see ULRM as key to that. And to put the U in ULRM, we want to make it handle, again, the SOF vehicle—the SWCS, Shallow Water Combat Submersible—and the large-diameter UUV.

Regarding LDUUV and submarine integration, I want to let you know we're working very hard with all of the stakeholders involved, and there are many. N2N6 is the resource sponsor for LDUUV; not N97. So, we have to make sure we loop them in. N96 also has a piece, because that same program of record for LDUUV is not going to be for three variants (sub landed, surface landed, land landed), if you will, trying to avoid the Joint Strike Fighter analogy for UUVs. But instead, one that can be launched from a submarine and also from, say, LCS. So, we want to make

sure they're all in on it and we're all synergized. And, of course, SOCOM is a big partner in that. In fact, they are funding a lot of the work on the extended DDS, which has shown that they have skin in the game for that. So, that's great stuff.

I thought it would be good to share with you what I see as some of the LDUUV guiding principles, because I figured probably somebody would ask me the question anyway. Again, this is Joe Tofalo's view. I've still got to work socializing these, but this what I see as I approach the UUV scenario.

First off, I'd say that a UUV has to be a tactical tool for the submarine to enhance its performance, reduce risk and extend reach. If the care and feeding of this UUV is something that's going to cause the submarine CO to have to stop doing his mission and worry about extensive care for the UUV, then this thing has not become the force multiplier that we need it to be. If it becomes a time and energy sump for the CO, that won't be helpful.

As we look at the SSN trough, that 11-year period where we drop below 48, certainly one of the things that will help us mitigate that is having a UUV on an SSN that can do that force multiplication stuff that we've been talking about. So, that's kind of my first guiding principle.

Second, I'd say that it needs to be capable of multiple sorties while on a given ship deployment. If we can't recharge the thing—you know, it can't be a one-hit wonder—then, that's not going to be helpful either.

The sorties have to be of long enough duration to permit host platform flexibility. For example, the host submarine may have to delay its rendezvous. If that's not built into the ability of the system to do that, then, again, it's not going to help the submarine captain extend his reach and be that force-multiplying aspect that the skipper needs it to be.

I see every one of them as having to have a standard sensor C2 kit that's capable of basic functionality. I think we have to avoid Aegis type UUVs, at least for kind of the standard notional fleet of ten of these. And I think it has to have built into it, organic to it, some weight and space allowance for dispensable payloads that can be restocked underway. That's where you would bring in the

uniqueness to the vehicle, whether that be devices to mark a bottom return, or unique communication or surveillance devices.

So, that's kind of Joe Tofalo's aspirational view of it all.

And then, finally we are excited about the opportunities with other payloads. There are numerous options on the table, from conventional prompt strike to missiles that are used in other parts of the Department of Defense, to lasers, cyber effects, et cetera.

So, all that is on the table. Again, I am not going to lie to you; FY'16 is going to be challenging. I think the Secretary of Defense clearly laid out in his remarks on Monday where he pretty much said to anyone who was listening—Congress and the American people—that if we don't have certain relief from sequestration, there are things we are not going to be able to do.

Stay tuned. We are on it. I'd like to tell you that it is not a question of if; it is only a question of when. We've got a great team working it. A lot of that team is in this room, and I thank all of you for that. And that is my story and I am sticking to it.

I think my time is up. Well, thank you very much for the opportunity to speak to you today. I look forward to working with you as we continue to make the U.S Submarine Force the greatest Submarine Force in the world.

Thank you.

NAVAL SUBMARINE LEAGUE
CORPORATE BENEFACTORS' DAY
February 27, 2014

REAR ADMIRAL DAVE JOHNSON, USN
NAVAL SEA SYSTEMS COMMAND
PROGRAM EXECUTIVE OFFICER, SUBMARINES

Thanks, John, for that introduction. And thanks to the Naval Submarine League Corporate Benefactors for putting on such a great forum.

I thoroughly enjoy the chance to talk to you. I always learn from you every time I talk to you, our submarine base, and our industrial base experts. I'll try not to duplicate, but instead add some flavor and detail behind what Joe Tofalo and Admiral Connor and Admiral Richardson said in their talks. But to start with, we're in much better shape. I'm more optimistic than I was back in October when I addressed this Submarine League last.

First, we have a budget. That's good. We're not sequestered; also good. We received additional money to fully fund the second Virginia-class ship in '14. That's pretty eye-watering on its own. Ohio Replacement is fully funded. And you just have to think about that; the program is growing in a time when everyone else is shrinking. And it's in RDT&E, which is a usual hit point when others are looking for money, but not Ohio Replacement. And we have a 10, not nine, a 10-ship Block IV contract that's ahead of us. We also have continued strong support looking forward to restart the Mk 48 heavyweight torpedo production line. This is all good, and it's all credit to the joint hard work that this Navy industry team does.

All right. There's also something I'd like to discuss that reflects on what Admiral Richardson said last night: that past returns are no guarantee of future performance. After thirty-two years in the submarine acquisition business—I was a direct access right out of the Naval Academy—I've gained a little bit of perspective. I've been fortunate to work extensively with the submarine platforms

in today's fleet. Sixteen years with the Virginia class, eight with the Ohio class, five with Seawolf and the Jimmy Carter, six with Ohio Replacement, and now I'm in my fortieth month as the Program Executive Officer for Submarines. And I'm going to say I am concerned. I'm concerned that we, our Navy Industry team, have become inured with our success. We have lost what I'll call our *Seawolf Edge*, a term that Chris Deegan first used when I came into PMS 350 to describe life there.

In the Seawolf program office you were living a near-death experience every single day: cost caps, loss of political support and attacks, and an acidic industrial base environment. One only has to look back to a 1991 *New London Day* article, and I actually saved that paper, when cracks were found in SSN 21 Seawolf's pressure hull, which eventually cost us about $50 million via an REA and about a year in schedule. Those were truly the bad days. I am not advocating returning to that. But I do think we need to reinvigorate that edge, challenge ourselves to outdo even our own record. Think about it. We have a young, and even mid-grade, workforce that has only known Virginia-like success. They never lived through a protest, nor a program killing material bust, nor faced a potential, complete shutdown of the industrial base. The *edge* is a different mindset, a keep on your *A-game* approach that got us to where we are today, a truly unmatched Navy/Industry team. We must collectively maintain a questioning attitude, anticipate problems, think ahead and think INDEPENDENTLY, and not fall victim to the biggest threat to our business, an attitude Al Ford drilled into our heads in SUBSAFE training, an attitude of ignorance, arrogance and complacency.

Now this team is certainly not ignorant. But, we can, and in some cases have, become over-confident and optimistic, which leads to complacency because of our success. So as leaders in this national crown jewel enterprise, we must lead our respective sectors to always keep the *Seawolf Edge*, keep giving Vice Admiral Connor the very best capability at the most affordable cost, and retain our position not only as the leaders in undersea dominance but also the leaders in defense acquisition. So with that

view in mind, I'd like to cover where my PEO is heading this year and how we're doing in a few key areas.

For the past several years, I've conducted a full day off-site with my leadership teams so that we can focus and align our efforts. I, along with Admiral Mike Jabaley, have posted our calendar year focus areas; this is the second year we've done this. Underlying all of our focus areas is delivering capability to the fleet on time and on budget. The community has truly fared well executing our plan over the past several years in these economic upheaval times. You've heard that. I think there's a reason. The value of the fast attack and the ballistic missile submarine is recognized both in DOD and Congress. We are a sound investment. We deliver on time and on cost. Tools like our focus area chart help my team ensure we're moving in the right direction and help us maintain that credibility we've built with our country's leaders both on the Hill as well as in the Pentagon. I'll just go through our objectives in our three Focus Areas:

Platforms:

- North Dakota: deliver it.
- Virginia Payload Module: submit the cost control report to Congress.
- Ohio Replacement: get our ship specs and our design work done.
- Ohio Replacement: work on reducing the non-recurring cost.

There are big items in our platforms area.

Weapons & Sensors:

- Capt. Moises Deltoro and PMS 415, deliver surface ship torpedo defense. I'll talk about that later.
- Achieve, or work on, the submarine large ocean interface. You heard some of that from Admiral Tofalo, and get our ULRM to sea.
- Define a modernization plan that I'll call the tailored 2/4 SWFTS model. We'll discuss that.

- Meet the PACFLT requirements for a deployable low-profile photonics mast to my friend, Rear Adm. Phil Sawyer, out in the Pacific Fleet.
- Deliver the heavy weight torpedo, and work on the heavy weight torpedo in the modular heavy weight vehicle readiness review panel to help set us on the right course as we do restart.
- Objective six is Cyber. Update our cyber vulnerability risk assessment.

I talked to the Naval Studies Board on the 22nd of January, and I told them I think we're in a tail chase. All you have to do is look at what we're adding, as we go through TI-10, 12, 14 and on to deal with cyber defense on our Submarine Force. I told them that cyber is just as important to us as processing a sound pulse. We have a lot more work to do there to make ourselves better in the cyber defense business.

Technology:

- Large flank arrays. Get that integrated with TI-14.
- Support Special Operations Force's dry combat submersibles. We have Capt. Keith Lenhardt down in SOCOM working for us.
- Conduct an at-sea demo of the belt tensioning mechanism which goes on our towed array handlers and get the AWESUM JCTD done which uses this Switchblade UAV.
- Formally integrate our submarine tactical requirements group with the IUSS requirements group process to try to get those better aligned.

So these are big rocks, not all inclusive, but it gives you a view into what we collectively think is important, going ahead.

Okay, that's what I'm going to talk about, starting with Vice Admiral Connor's and Rear Admiral Tofalo's priorities; platforms; and then on to the payloads.

Alright, first the Virginia Block IV contract. The bottom line is once we sign this contract in the coming weeks, we'll officially continue our two-ship build rate into FY18; eight straight years of two Virginias per year. We have not seen a build rate like this since the end of the Los Angeles class and the beginning of Seawolf, between 1982 and 1989. So from 2011 to 2018, we're building 16 SSNs, which is more than half of the Program of Record for Virginia. Now, you probably realize, it will go beyond 30, likely to about 48 to 50.

If you remember back to 2005, and I certainly do, our goal was to increase production to two-per-year in '12. We achieved that one year early, due in a large part to our combined effort. The Virginia-class Navy/Industry relationship is the most successful, and I'll say tight knit, in the Department of the Navy and DoD. We would not see this build profile without that tight knit effort, but one thing that this two-per-year build rate also means is that our tuned industrial base has little margin for error, late or defective equipment, poor quality, or material problems. We will be much more severely impacted. In short, we have truly pulled out some of the resilience that a one-per-year build rate has.

The history of Virginia-class deliveries is a very familiar story to us right now. Our challenge is to continue this tradition of early deliveries with the delivery of the NORTH DAKOTA in spring. As with any first of class, and NORTH DAKOTA is almost its own class within the Virginia Class, we're working through some unanticipated issues. These will be resolved, and we will (per our standard) deliver a ship that's ready for tasking.

At the October symposium, I said, "We're tracking towards a January delivery." Now, I think it will be May, which might make it a little tight because there's one date that I know is not changing. On 31 May, we're commissioning that ship. So that keeps us going. Even though my prediction from October did not come true, the delivery in May will still be three months early to contract. When you place that on the delivery history chart, "Oh, big deal…three months. Well, when you start laying it in the context of construction span…pretty good. Despite being only three months early, NORTH DAKOTA will come close to

matching the 62-month shortest construction span for the Virginia Class, and that's with, as Joe Tofalo pointed out, "20 percent of the ship being redesigned." Conventional wisdom is that extensive redesign means reverse learning, taking longer, costing more, and on the first ship that's usually true. NORTH DAKOTA…nope. First of the block, and we're going to deliver early. That is truly a significant feat. We should not forget that.

I'll also note what Kate Kaufer said. For those of you who may not know her, she's a professional staff member on the Senate Appropriations Committee (Defense). During a visit to Electric Boat she gave her insight into our business. Pretty good. Simply put, she told EB that the onus is on EB to perform on the work they have. Why? To maintain their credibility. That goes for Newport News and that goes for every one of us in this room. It's a universal view. Credibility is so important.

Next for discussion is the Virginia Payload Module. I said we fared well in the submarine community. We received a billion dollars to fully fund the second submarine, but we also recovered our FY13 sequestration cuts. That's pretty good. We have an unmatched track record in DOD acquisition, and we are truly a model for Secretary Kendall's better buying power initiatives. Time and time again, investing in our Submarine Force has proven to be a good investment. We live up to our Team Submarine standard. We deliver what we say we're going to deliver, when we say we're going to deliver it, and for what we say it's going to cost. That's our standard. I believe that's one reason why Congress gave use the money. They gave us the $59 million to begin work on the Virginia Payload Module, and this is also during a time of shrinking budgets.

We've done some preliminary work to narrow down the different options to building this module. It will be a 70-foot hull section with a slight hump. This is the most cost-effective means, we think, of incorporating a VPM into the Virginia Class and one we're going to keep working on with our money. The $59 million in 2014 comes with one caveat, $20 million of that is being withheld until the Navy submits a report to Congress on what we're doing to control costs on the VPM design and construction.

I happen to agree with Congress here. We owe them our plan to stay within cost thresholds, which we frankly have a track record of doing for only the last nine years, and I intend for us to keep doing so.

So that's Virginia, and it's good news. Next for discussion is the Ohio Replacement.

I remind people we are delivering a capability. Admiral Benedict will get up here and will talk about what we're delivering with the Ohio Replacement that is critically important to the Navy, the country and our allies who depend on us to provide a nuclear umbrella.

I mentioned in October that Ohio Replacement is a different type of program. We do have three distinct parts that all have to come together seamlessly: propulsion, missile compartment and the rest of the ship.

Cost is important. We saw Secretary Hagel's announcement this week. Make no mistake, budgets are being cut, and we are not immune in the Submarine Force. We have to keep this program on schedule. We have to keep these funding lines aligned so that we deliver, affordably, these twelve ships.

I'll call the Ohio Replacement Schedule our "Collective Message" Chart. This is the detail behind what Admiral Richardson said when he articulated the importance of the 2021-back-to- today time span, and how that's a bit of a fuzzy spot in many people's minds. It represents the design and R&D progress and plan. It is anchored in the future on the first deployment in 2031. Lead ship test and evaluation and post shake-down availability come at the end of that period. We have three years staked for that. There is a seven-year build span. Design and construction support activity will bring us to where we are today, almost into year four of the technology-development phase. This phase is so important because it lays the foundation for SCN funding designs starting in 2017 and ship construction starting in 2021. Critical to our success is the Capability Approved Document. It is a Navy-approved document, and it gives us the requirements to focus the design on the right work and control

costs. We are taking that guidance, and it is going today into our ship specs and into every facet of the design.

We're going to complete, this year, our 161 ship specification sections. Capt. Bill Brougham and Admiral Fuller will sign out those sections on the 31st of March with only a few outliers. They will define the hull, mechanical and electrical systems. We're now into the next phase: diagrams, descriptions, arrangements. Now, the one key element: our ship length. It's taken about six months longer than I told you it would, but it's done. Now we are in detail design in the missile compartment, and you'll see some of that.

So why dwell on this? Simply because this early stage work is critical to achieving a design that's 83 percent complete at construction start; is producible, with few design errors; and above all else, is affordable in design, in construction and in life cycle; a non-trivial task given that we are delivering an SSBN that's frankly quieter than Virginia at SSBN speeds.

Restarting a dormant missile tube and launch tube industrial base, constructing three major test facilities, and achieving a ship that will meet a 124-patrol per ship op cycle; the most demanding of any platform anywhere, all done with an affordability target and on a schedule which has to be met. Otherwise we just aren't delivering and giving STRATCOM what he needs for the mission.

So a few key points that will help us keep on message here:

Construction. Lead ship construction is seven years. FY21 to FY27. It's aggressive, given the Ohio Replacement will be the largest submarine ever built by the U.S. with a lead ship construction span shorter than the previous three lead ships, Ohio, Seawolf and Virginia.

Design. We have design activities sequenced to support construction. The scope of our design is unparalleled. The Ohio Replacement is the largest design effort in the Navy's shipbuilding history, and about 50 percent greater than what we did on Virginia. We have to have a high design maturity at construction start. It is crucial to meeting this aggressive construction cost and schedule challenge. The scope of our technology development effort for

Ohio Replacement is bigger than what we did on Virginia, and the design plan has to include these very important prototyping efforts. Implementation of a new integrated design tool adds some additional challenges; just like CATIA did for Virginia. The design plan needs to account for the relative immaturity of the Ohio Replacement design and construction workforce compared to Virginia. We aren't rolling off Seawolf hot into Virginia. We are rolling off a gap. We haven't designed a complete submarine for twenty years.

Funding challenges and schedule slips. This is different than Virginia. They're going to introduce churn within the design plan, and we have to manage that. So, in summary, if you look at the design, there really is no elasticity, or margin, in our design. Based on known best practices in the Navy shipbuilding programs, technology development assessments, expected performance based on major design challenges, and the relative inexperience of our design team, the Ohio Replacement program has been aggressively planned to meet these lead ship deployment plans with no further room for delay. As Joe said, we have taken out all the efficiencies. We are there and we have to execute.

So that gives you a little insight into where this design is relative to what we've done in the past.

If you look at our ramp-up to start of construction it has a flat spot, two-year delay, but we're now on a ramp going up. Our curve from now to 2021 represents the design yard's hours. We have done a good job of continuing to drive down the overall hours. We're on an up ramp all the way to 2019, but what's important is the progress through requirements, arrangements and detail design.

Our effort in 2013 was mostly concept requirements. This year, most of it is arrangements, detailed design, deliverables, analysis and calculations. It's a fundamental shift in what we're doing in 2014. We are in the business now of getting the design done on a very, very aggressive pace to meet our requirement of 83 percent done by construction start.

It's a challenge, but it's entirely achievable if we stay on plan. In the middle of our ramp-up to construction start we have deliverables we have to meet, and guess what? We're starting to put deliverables out the door now, this year. We've got to get the design work done on time, put the products out, which are keyed for 52 weeks in advance of construction need schedule, which is what we learned in Virginia is the right way to do this.

Very, very important work, and one other thing that's hidden in this, you may not know, is that the CMC (Common Missile Compartment) design is driving the current phase of what we're doing. We're a little bit out of sequence because of this shift, because the UK did not move when we moved.

We've had some great successes this last year. We've done things which are very innovative. Show me another X-plane ship since probably the Albacore. We have our joint U.S./UK schedule approved, so we've got an alignment between us and the UK which is very important because we're feeding design products right to their design agent. The team has been very successful at getting missile compartment fixtures bought, collaboratively, between the two countries, to save cost and also keep these things as common as possible between the two build sites, Barrow-in-Furness and Electric Boat.

We've set the ship length, it's within inches of the size of Ohio. We should not be apologetic for that. It is that size because of the stealth requirements and because of the maintainability requirements on that ship and the cost. It's exactly the right ship for the mission set that's put on it. It's going to deliver 124 patrols, which by the way, is two more than Ohio does in her op cycle.

Ongoing and upcoming, we have a full slate of work this year, a lot of HM&E testing, propulsors, runs of the Large Scale Vehicle at Lake Pend Oreille. We're doing COOPEXs, we're doing missile tube manufacturing. We're about to let the next contract for buys. We already have one out the door in November. We're doing one in February and one in May, so we're moving, and we're also doing physical scale model testing. It's that prototyping work so that the design is done once, it's built once, and right the first time.

So the ramp-up and design yard personnel is key to improving our design execution, but it's still an area where we have to focus that 83 percent.

Ohio Replacement is, without a doubt, the country's number one new acquisition program. More important than Joint Strike Fighter; this is it. To keep our leaders' faith, we have to continue to show we're achieving our cost reduction objectives; very important.

Last but not least, we moved ship construction from 2019 to 2021, so we need to stay in sync with the UK. We need to stay on track with them. We have to support the UK.

So that's the platform piece, and I have five minutes to cover the rest. First to be talked about is SWFTS (Submarine Warfare Federated Tactical Systems). One of the ways we're looking at cutting our budget is to retool the Submarine Force's SWFTS model, which is our combat systems modernization.

We're trying to be smart about this. I want to get to a predictable eight- to nine-a-year installs instead of two, five, fourteen, ten, which is very disruptive to our industrial base. If we can get to a straight eight, or a straight nine, we'll be achieving better, frankly, than we do today.

We will align this plan in 2016. We will alternate between Virginias, then go to Los Angeles and Seawolf in 2018 and then back to Virginias in 2020. It's going to take a little more management but it saves research and development, and it also saves in procurement. Over $200 million dollars out of the FYDP and I think this is a smart adjustment to this industrial base. We're going to have to manage obsolescence a little more carefully, but if you just continue the model and don't disrupt us, we'll actually be a little better than we are today on average of the age of our systems across the fleet.

Payload is the next topic. There's a lot going on. As I told you in October, we're going to start rebuilding the Mk 48 torpedo, and we are well on our way. The goal is to award two contracts; one for guidance and control, and the other for the after body and tail-cone efforts in the fiscal year 2016 with a technical data package completed a year later. In 2018, we'll reach our production

readiness review and, if it all goes well, which I anticipate it will, we will start producing weapons, at a rate of two per month, starting the same year.

In October, I said we'd broken the weapon apart, and we planned to have industry deliver the components to the Navy which will then integrate, test and ultimately deliver the weapons to the fleet. Under our current timeline, we expect to deliver between two and four Mk 48s a month between FY18 and FY22. That adds up to 152. So if you do the math, that's only about a third, so there's more ahead.

I think it's important for you to know where we're going. We do have, as a precursor to this though, the review panel, to make sure that A) this is a solid plan, and B) how can we be smart about leveraging this investment to work our way towards the modular vehicle that Admiral Connor talked about, which is very important and, frankly, part of our future.

USS GEORGE H.W. BUSH (CVN 77) departed on February 15th with the first hard-kill Surface Ship Torpedo Defense on board, tested, used by the crew and ready for tasking. Unbelievable.

The countermeasure anti-torpedo (CAT) sits in a nice little home. We call it an all up round enclosure. Very simple, you just load the weapon in there. The CAT sits in its own enclosure and when it's told to go, it impulses out much like an air bag to shoot the CAT. A very, very capable new torpedo that Dr. Ed Liszka and his team at ARL Penn State have designed.

We took this and made this a little bit of a different program. We pretty much chucked DOD 5000.2. Paul Schneider and his review team helped us to give top cover on that, but we took a CNO priority system, worked the team, 3 Phoenix, Pacific Engineering, Penn State and our government team, and in sixteen months got it to sea and tested. And overall in 25 months it's underway on the Bush, right now, heading to theater.

It's the kind of responsiveness and ingenuity we need to weather this budget environment. It's not a submarine system, but it's an example of what we can do when we put our mind to it.

Next let's talk about towed arrays. I didn't talk much about this in October, but it's important because it's an ongoing concern with the fleet. We have to make our arrays and their handlers more reliable. So we're looking at a way to make the telemetry simple, the array simple and the handlers less disruptive on the array itself.

We have two arrays at sea today on two ships, a compact towed array from L-3 Chesapeake, on USS COLUMBIA (SSN 771) and the IPEN (inverse passive electrical network) telemetry from 3 Phoenix aboard USS PASADENA (SSN 752). We're running these arrays through their paces with the goal of collecting data that allows us to refine the design so we can be confident of providing the fleet with a reliable and capable towed array.

We also are working on the handler. We have a MacTaggart Scott belt mechanism. We've done land-based testing, and we're getting this to sea on a 688 in the spring, maybe this summer, so we can see what it does. If it actually works out, I want to roll it out as fast as we can get it out the door to get rid of the darn pinch rollers, so that they quit damaging our arrays.

We are trending in the right directions. This is a great acquisition model. Get good mature prototypes out in the hands of the war fighter, understand them, do it competitively and then drive affordability with the competition. Then, if you're crafty enough about it, you can cobble enough money together to make it work. That's exactly what we've done here.

For the low-profile photonics mast (LPPM), we're meeting Admiral Sawyer's and Admiral Connor's demand signal.

We have three prototype LPPMs, two from L-3 KEO and one from Cassidian and 3 Phoenix. We'll have to use these masts to support ops and cross-deck them from one boat to another. It's not ideal, but it fulfills a requirement, and we're going to go into production with a competitive contract, we think, in 2017. As Ken Swan, at L-3 Kollmorgen told me last night, I have to get up there to go see, on the stand, the first LPPM that he's going to deliver soon to Jack Gellen, I think it's March, and then six months later number two follows. So two LPPMs out, integrated with the Lockheed Martin ISIS, and off it goes to Phil Sawyer to use on the fleet. We'll learn, and we'll use this same model, get into

production, competitively bid, and off we go. Truly an example of meeting the fleet's need.

We've talked about payloads. Well, you need something to hold the payloads in, and we call it another awful acronym: the submarine large ocean interface, the SLOI. I'll take any input on a better acronym.

What we have today in SLOI is represented by six dry deck shelters, four experimental tubes in the SSGNs and lastly the delivery of the soon-to-be North Dakota this spring. Twelve large diameter openings that allow people and payloads to deploy from submarines and into the water column. With each Block III Virginia we deliver, the number goes up by two. Now, we know the primary use is Tomahawks. When we do the Block IV and Block V ships, however, it's an opportunity, and I think there's a lot of room for growth and innovation here. We know how much life we have left in our dry deck shelters. Well, this is what we're doing about it. They go to 2051, by the way, so getting a new design, a brand new build shelter is not likely. So let's take what we've got and be innovative. We need to take the man out of the loop, in terms of their operation.

When deploying a SEAL delivery vehicle, we have to manually open the door, winch out a track and cradle, launch the payload and then bring it all back in. This is a dicey evolution when you've got a 5,000-pound vehicle. When you have a 30,000-pound vehicle, you cannot do that. It has to be done differently.

So Capt. Mike Stevens and his program office are exploring automating the hangar door and cradle, the launch and recovery of payloads, as a technology demonstrator, and it's eye-watering. We've got a co-sharing agreement about to be inked with our Special Operation Force's friends in Hondo Geurtz. So a great sharing effort so that we can get a demonstrator out there to de-risk the shallow water combat submersible (SWCS) as well as the dry combat submersibles that are our future.

Now, I know Franz and Electric Boat sometimes would like to see a 100-inch extension, but I think 50 is about what we're going to get right now, and we'll use it to establish a pull from the fleet for more capacity.

It racks out between the legacy vehicle and the DDS today and potentially you can fit more in there. The shallow water combat submersible is bigger. It goes up to 10,000 pounds, almost twice as heavy. You put a little sea state on that, and you can get hurt, while you're hauling that thing down on its cradle.

UOES1 is S301 in everyone else's vernacular. It's the submergence group design vehicle; UOES-3 is being done by GSE and Electric Boat; these are big vehicles. If we're going to host bigger vehicles with more capability we'll probably have to go longer than 50, but you've got to start somewhere. It's going to go on USS HAWAII (SSN 776). It will be tailor-made for our Virginia-class ship to save cost, and we'll establish the demand signal. There will be more to follow.

So to conclude, one of the main reasons for the Submarine Force's continued success is the people in this room, and I truly believe that. Our ability to form partnerships, and not just business relationships, is what sets us apart from everybody else. We have proven time and again that we deliver on what we promise. Congress and the Pentagon recognize the value of the fast attack and the fleet ballistic missile submarine, the Virginia-class program got more money even above the President's budget requests. And we received the money for the Virginia Payload Module. Investing in the Submarine Force is a good investment because we deliver on our promises. They go together. By living up to our own high expectations we make it hard for people to cut us. There's also room to grow; I just described to you the Submarine Large Ocean Interface where I think we'll go for new payloads in an era of diminishing resources. The ability of our submarines to operate in the A2AD (Anti-Access/Area Denial) environments means we're the right people to put payloads where they need to be. So Admiral Connor, IUFS—Integrated Undersea Future Strategy, if I have it right—we're not just studying it or planning it, we are doing it. I've described some objective evidence.

And lastly, don't forget the *Seawolf Edge*. That will resonate with folks like John Butler, Steve Johnson, Chris Deegan, Paul Sullivan, John Casey, and me, frankly, to name just a few. It is an

energy, focus, intensity. We are the best. I, my team, and this industrial base are committed to staying there and delivering the undersea dominance our nation needs. As we were told by the CNO, be bold, be confident, be accountable. Pretty good sailing directions.

Thank you.

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.

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ARTICLES

CHIEF OF THE BOAT!

by CMDCM/SS Eric H. Antoine, USN

Master Chief Eric Antoine joined the United States Navy on 26 February 1985.

His early sea tours include USS GREENLING (SSN 614) and USS SAN FRANCISCO (SSN 711) as an Auxiliaryman. He advanced to Chief Petty Officer in 1996 and transferred to USS PARCHE (SSN 683) as the Auxiliary Division Leading Chief Petty Officer. He completed three missions onboard PARCHE.

Master Chief Antoine has served as Chief of the Boat on USS OKLAHOMA CITY (SSN 723) and USS GREENEVILLE (SSN 772). On OKLAHOMA CITY the ship conducted a WESTPAC Deployment in 2004, the first submerged launch of an UUV from a SSN and was the first submarine certified to electronically navigate with the Voyage Management System. On GREENEVILLE, the ship completed an extensive Depot Modernization Period and a successful change of Homeport to Pearl Harbor, HI.

His shore tours include instructor duty at Naval Submarine Training Center Pacific, the 4th Company Senior Enlisted Leader at the United States Naval Academy, Department Master Chief at Naval Submarine School, and as Command Master Chief of Naval Submarine Training Center Pacific.

He reported in June 2011 as Chief of the Boat onboard USS JIMMY CARTER (SSN 23). During his tour the ship was awarded two consecutive Battle E awards, and the Presidential Unit Citation. He was recognized as the 2013 FLEET MASTER CHIEF FRANK LISTER Award winner for Leadership and Motivation while serving as a Chief of the Boat by the Naval Submarine League.

From 2000 to 2003 I was a Company Chief at the United States Naval Academy. With a Brigade of 4,000 Midshipmen and a large cadre of the Officers that trained them, the twenty-five Chief Petty Officers and five Gunnery Sergeants were, and remain, a small minority at the Naval Academy. I came to very much enjoy my time there and I am very proud of every Midshipman with whom I had the opportunity to serve. The Submarine Birthday Ball's theme was *A Salute to Heroes*. At the Ball I sat at the table quietly eating, slightly self-conscience about being the sole enlisted person at the Ball. My wife was speaking to an elderly woman who was inquiring about my career, where I had been and what I was doing next. My wife told her that I hoped to be a Chief of the Boat. Her husband, who up until this point, had barely paid attention to anything but his soup, practically dropped his spoon, bolted straight up in his chair and shouted "CHIEF OF THE BOAT! I remember my Chief of the Boat!" I then spent the rest of the evening talking with a submarine legend, Captain Slade Cutter.

There is history with the role of Chief of the Boat that extends far beyond any *Big Navy* ideal of a Senior Enlisted Advisor, Senior Enlisted Leader or Command Master Chief program. He is a Chief Petty Officer the Skipper could rely upon to take care of the crew, train them, enforce good order and discipline, rally the Chiefs to perform, make the ship ready for sea and, along with the XO, be his personal confidant. How the COBs were selected, and their exact role was as varied as the ships they served upon. In the early days, before the introduction of *Super* Chiefs—as the old salts refer to Senior and Master Chief—a Chief's selection as COB was performance based vice seniority based. Some of the older, more experienced Chiefs simply did not seek the hassle of additional responsibilities. One's selection as Chief of the Boat is now a fairly formal process with a qualification card, an oral board, and its own Navy Enlisted Code of 9579: Submarine Chief of the Boat. But their charge remains essentially the same as we pass 114 years of submarining.

No one says you have to be a COB. There isn't a career path that directly leads to becoming one. You can have a rewarding and successful career without achieving the title. You have to decide to become a Chief of the Boat. COBs come from every forward rate and there are even the occasional nukes. There is a qualification card but, completing the card doesn't necessarily make you a COB, or worthy. You have to be a top-performing Chief Petty Officer, qualified Diving Officer of the Watch and have the drive to attain the skill sets needed. All COBs are all products of their individual experience, not the result of an established timeline of required tours.

As for myself, I had been a Chief about a week in September of 1996 before I decided to set my sights on one day becoming a COB and not a Diesel Inspector. At that point I had made the decision to become an expert in leadership and people, vice a specialized technical expert in an area in which I had a great aptitude and interest. To one day become a COB, my experience learning as Chief, the ability to develop my Sailors, my watch team, and working within an exceptionally talented Chief's Quarters on PARCHE were essential. I was lucky to have great mentors in that Goat Locker. They were hot running chiefs and of course, my COBs. My COBs during three years on PARCHE were Danny McHugh and Mo Pollard. Two sides of the same coin, different techniques, same great product. I consider them both my mentors to this day and I value their friendship. That CPO Quarters on PARCHE developed ten COB's and many others that would go on to become Master Chiefs, EDMC's and LDO's. The experience to work within a winning team and build great Sailors—because we were mentored and held to a standard—laid the foundation that allowed ten of us to go on and become a Chief of the Boat.

The COB represents the institutional knowledge of the Navy and the Submarine Force. Consider that prior to becoming a COB he has made two deployments as a Junior Sailor, two as First Class, two as a CPO, and maybe two more in a Department Chief position and will have eleven years of sea time to the Department Heads three or four years, the XO's seven years and the Captain's

eight to nine years of sea time. He understands preparing for deployments and getting families ready to ensure what we now call individual readiness. Also consider that his shore tours have kept him close to the waterfront. He has, either as a technical expert or a leader stayed connected to the Submarine Force. Then, that institutional knowledge is leveraged to train and prepare Sailors to go to sea and operate in forward areas alone and unafraid. He uses that institutional knowledge and experience to improve the performance and capabilities of his Chiefs. Other CMC's in the fleet are good order and discipline, heads, beds, program leaders on the deckplate. The COB is that as well but, his institutional knowledge and his deployment experience is required to be used in the operational planning and execution of tasking of the ship by his crew. His experience is invaluable when training a crew and gives him the ability to provide sage counsel to the Commanding Officer. The training and proficiency of the Ship's Control Party, topside line handling and damage control, basic submarining and submarine qualifications fall under the responsibility of the COB. All of his experience as a Submariner up to point of him becoming a COB is brought to bear to ensure the success of his crew. And a COB's experience—where he has been, and what he has done-is evaluated immediately by any Commanding Officer and the crew as they determine his credibility as soon as the orders pop up on the board.

As I had said before it seems we have always had COB's. Dick O'Kane wrote about *Pappy* Rau, the COB on WAHOO, who while on war patrol would draw the trim system on the deckplates of the pump room for School of the Boat. Sailors on the NAUTILUS remember their first COB and reflect on his ability to know the crew and convey the pulse of the crew to his Commanding Officer. The COB knew the command tone. That tone is set in so many ways that are directly affected by the COB. The COB has to manage relationships: His special relationship with his CO, his relationship with the XO, his relationship with the Department Heads, his relationship with the Chiefs and Division Officers and his relationship with the entire crew. With the exception of his relationship with the Commanding Officer, there is no hierarchy in

these relationships and the priority constantly rotates. Build confidence in the JO's as watch team leaders, push Chiefs to lead and manage effectively, work with Department Heads to operationally plan and run the ship and work hand in hand with the XO to provide the best support, advice and back-up to the Skipper and take care of the crew by ensuring standards are met and upheld consistently and fairly. The latest *Commander's Guidance to the Submarine Force* refers to the Chief of the Boat as *the linchpin* to command success. I think it is an excellent product that any COB can use to measure his effectiveness and performance. It is concise and eloquent. While my experience as a COB, the good days and the bad days in the seat, has taught me as much, it would have been great to have ten years ago when I was a young COB to use for self-evaluation. The COB is the one who receives the Commander's intent, from the broad operational spectrum to the mundane, and makes it happen.

As a COB I have developed and used principles I refer to as *Quality of Service* to accomplish and meet the expectations that every level of the chain of command has in me as a Chief of the Boat. I wanted to capture a different tone from Quality of Life. Quality of Life has become off-duty centric, which is great but, I wanted to capture principles that enriched the job satisfaction of the Sailor in the performance of his duties, improved workplace efficiency and the alignment of priorities. The principles of Quality of Service dovetail with the *Mission, Vision, Guiding Principles of the Chief Petty Officer*, the *Commander's Guidance to the Submarine Force* and MCPON Steven's three *Zeroing in on Excellence* points. But, I could have never forwarded and implemented these ideals without the full support and buy-in and go ahead of my Commanding Officer. His faith in my experience and leadership allowed these principles to become part of his Commander's Intent and set a positive tone and command climate on a ship with a tough operational schedule. An investment in a learning environment did not help me develop these principles, they were not developed in the classroom. They were developed from years of both success and defeat on the deckplate of submarines going to sea to perform critical missions vital to

National Security and accomplishing arduous maintenance availabilities inport. The perspective of experience lent clarity to the reality of how to make things better. The principles of Quality of Service are:

1. Sailors understand standards and tasking. Standards are clearly communicated and reinforced.
2. Everyone has the opportunity for success.
3. Defined workday and schedule.
4. Sailor recognition.
5. Accountability.
6. Training.

Our dedication to the principles of Quality of Service demonstrate to the crew the command's commitment and respect for their service to our Country, our Navy, and our Submarine Force. It has set the tone for excellence on OUR ship.

So, as I read about the heroism of *Pappy* Rau or the impressions of the NAUTILUS crew of their COB, and reflect on their leadership and my own, our impact was not only in our ability to know the pulse of the crew but our important role in the operational success of our ship. I am satisfied that although as COB's we all came from a different era, a different selection process or even different defined expectations of our responsibilities, the United States Navy's Submarine Force has continued to develop and then depend upon the experience of its senior enlisted in a position of special trust: To develop the Sailors who are National Treasures and operate irreplaceable National Assets that navigate the world's oceans with impunity.

SEAWOLF AND THE MARITIME STRATEGY

by RADM Jerry Holland, USN, Ret.

Republished, with permission, from the original article "Strategy and Submarine" in the December 2013 issue of the Naval Institute Proceedings. With the title change several small additions have been made to the original.

RADM Jerry Holland is a frequent contributor to THE SUBMARINE REVIEW.

The crafting of a strategy for defense of the sea in the 1980s and the near-concurrent construction of a new class of nuclear-powered submarine present a study in policy, strategy, technology, tactics, and acquisition.

Logic suggests that policy directs strategy, which in turn leads to tactics to execute that strategy. These tactical considerations then become the foundation for development of supporting technologies. The technologies developed lead to acquisition of the equipment necessary to support the tactics. This logic, adopted from business and economic models, is the basis of the Planning Programming and Budgeting Systems.

Experience suggests that the real paradigm works differently. Organizational knowledge built on an understanding of environment and mission enlarged by study and experience forms the foundation of tactics. From this basis, an understanding of national interests, a sense of the history of conflict, a grasp of the capabilities of potential enemies, and an appreciation of technology all drive tactical opportunities. These in turn establish the designs for development of technologies and future acquisitions. Equipment developed makes possible improved, advanced, or different tactical possibilities. These new tactics in turn allow changes to strategy. Such changes may or may not then be reflected in policy.

The 1981-86 *Maritime Strategy* and the coincident design and construction of the USS SEAWOLF (SSN-21) offers an unusual

opportunity to address the question of how these aspects interact. Technical developments directly reflected ongoing operations and thereby influenced both submarine acquisition and the strategy for their use. The influence of operations on strategy can be seen in retrospect. Conversely, practical influence of national policy on the design, acquisition, and operation of submarines is not evident.

From the beginning of the Cold War, U.S. military strategy focused on the Central Front in Europe. In the event of war, the Navy was to protect the sea lanes linking the United States and Europe. Based on the experience of two wars in the Atlantic, leaders assumed a horde of Soviet submarines would interdict the sea lines of communication between the two continents. This view of the probable Soviet campaign in the event of war mirrored the campaign most American naval officers would run. This antisubmarine warfare (ASW) mission dominated Fleet employment. In the event of war, the Pacific Fleet would *swing* to the Atlantic to become part of this effort.

Through the 1960s American defense leadership focused on the Vietnam War and the nuclear arms balance between the Soviet Union and the United States. Little time or energy was devoted to new strategic initiatives or technological developments outside these immediate issues. During the tenure of Secretary of Defense Robert McNamara,

> . . . gaming was rejected as an analytical tool because its results were not sufficiently precise or repeatable or, for that matter, grounded in sufficient understanding of enemy behavior. . . . This approach examined the way alternative technologies could handle the Soviet fleet on the unstated assumptions that the overall strategy would remain fixed.[1]

This policy froze both strategy and examination of major technical developments.

The Soviet Navy first deployed submarines equipped with ballistic missiles in 1958. The range of the missiles required the

submarines to operate in the North Atlantic and Pacific oceans in order to threaten targets in the United States. The conventionally powered *Golf* and *Hotel* classes were replaced by nuclear-powered *Yankee*-class submarines operating in patrol areas in the mid-Atlantic and Eastern Pacific in the 1970s. These missions were carefully monitored by the U.S. Navy and provided training for its ASW forces so that by 1970 American naval commanders had confidence in their ability to track these ships. With the commissioning of the first *Delta*-class ballistic-missile submarine armed with a longer-range missile in 1972, the Soviets no longer had to transit into the North Atlantic to threaten the United States.

In 1971 Commander Robert Herrick's study of Soviet strategy and behavior suggested that the Soviets would use their Navy in a defensive mode.[2] This proposition gained few adherents in the West: official positions continued to predict Soviet naval offensive operations in all theaters.

Though the national military strategy remained basically unchanged in the Nixon administration, in the spring of 1968 efforts to describe a new attack-submarine class began, instigated by Admirals Hyman Rickover and Levering Smith and directed by Vice Chief of Naval Operations Admiral Bernard Clarey. A panel of six submarine captains, buttressed by designers from the Electric Boat Company, convened to create the specifications for the new class. Led by then-Captain (later Vice Admiral) Joe Williams, the group produced characteristics that eventually became the *Los Angeles*-class submarine. This was to include improved quieting, higher speed, and upgraded electronics. Efforts to quantify the required speed were extensive but unsuccessful. Nevertheless, in the minds of responsible parties in the Navy, quieting and high speed remained an absolute necessity for this ship. "Never again should we field a submarine slower than many of the Soviets."[3]

Endorsement of the need and qualities for a new design was not universal. Some impetus for the new design had come from Rickover's earlier endeavors to build a submarine with 60,000 shaft horsepower. In this he had been opposed by then-Rear Admiral Elmo Zumwalt, Director of the Systems Analysis Branch

of the staff of the Chief of Naval Operations (OP 96). The conflict between them was direct, severe, and evidently acrimonious. In a truce engineered by Clarey, Rickover backed off his advocacy, and Zumwalt abandoned his objections to the new ship. The effort not only produced the new design but defined major research and development efforts that would affect the follow-on class, which became the SEAWOLF. Among these were new high-tensile hull steel, high-power reactors, titanium fabrication for equipment foundations, high-power low-voltage electrical generators, broadband sonar detection, narrowband passive ranging, and retractable towed arrays.[4]

The new submarine was to have high speeds to rapidly close the forward area of operations, exploit datums developed by wide-area sensors, have at least a 5-knot speed advantage for sprint and drift tracking, and provide direct ASW support to surface forces.[5] These design criteria did not reflect national policy or overall military strategy: They were characteristics derived from best practices by experienced officers and operations in the field. In part they were reacting to the capabilities of new Soviet *Victor*-class submarines.

Through the Ford and Carter administrations, Secretaries of Defense Melvin Laird, James Schlesinger, Donald Rumsfeld, and Harold Brown concentrated on ending the Vietnam conflict and then harvesting the dividend that came from the reduction of forces following evacuation from Southeast Asia. Focus remained on the Central European front. Navy leaders' energies concentrated on correcting the poor material conditions resulting from high operational tempos and long deferred maintenance during the Vietnam War. Late in Admiral James Holloway's tenure as CNO, senior officers began to examine the Navy's roles in case of war with the Soviet Union—again without apparent direction from higher authority or national policy.

In August 1976 Admiral Thomas Hayward took over as Commander-in-Chief, Pacific Fleet and recognized the existing strategy accepted that NATO would probably not be able to withstand a Soviet attack in Europe without having to resort to tactical nuclear weapons. The planned Fleet swing from the Pacific would arrive

Pacific would arrive too late to affect this calculus while at the same time uncovering the Asia-Pacific theater. Abandonment of the Pacific by the major American force would place Japan and South Korea under heavy pressures to remain neutral and diminish any Chinese threat, thus freeing the Soviet Far East land and air forces to reinforce a Soviet offensive in the West. Supporting this logic, intelligence examination of the trans-Siberian railroad found that the Soviets had double-tracked the entire line and established stockpiles for all-weather operations and emergency repairs as preparation for shifting their forces from the Far East to Europe in the event of war.

Hayward directed his planning officer, Captain James M. Patton, to redraw the Fleet's war plans, shifting from a defensive posture to prompt offensive action against the Soviet Navy afloat and the Soviet infrastructure ashore. Senator Sam Nunn (D-GA), Chairman of the Senate Armed Services Committee, who worried that the threat of failure of NATO's conventional defense would lead inevitably to nuclear warfare, criticized commanders for their lack of a posture that would forestall the resort to tactical nuclear weapons. Completing his tour of commands in the Pacific, Nunn was briefed on the first iteration of Hayward's alternative to the swing strategy. Nunn's endorsement was key to recognition of this strategy.

Within four weeks Hayward was visited separately by Secretary of the Navy Claytor and Secretary of Defense Brown. Briefings of the major staffs in Hawaii, the Joint Chiefs of Staff, and National Security Advisor Zbigniew Brzezinski followed. Within a year all were working on new war plan for the Asia-Pacific Theater, incorporating all U.S. forces there in offensive action against Soviet bases in the Far East. Part of the plan was to demonstrate to Tokyo, Seoul, and Beijing that the United States was committed to remaining in the theater, denying the Soviets local hegemony.[6]

Fundamental to these plans were equipment and tactical developments that had been taking place since the beginning of the Nixon administration. Broad ocean ASW technologies under development since the 1950s entered service. The Sound

Surveillance System was operational over most of the Atlantic and much of the Northern Pacific. Air-dropped sonobouys and the supporting computers had been installed in maritime patrol aircraft. In March 1972 Towed Array Sonars deployed for the first time in the Pacific Fleet. These devices feeding computers gave the American ASW forces a marked acoustic advantage over their Soviet counterparts. Tactical development, previously centered on platforms, began to explore coordinated antisubmarine operations involving submarines and aircraft. In 1976 coordinated ASW exercises were pioneered in the major Rim of the Pacific exercise.

As Hayward's plan was refined and the Fleet moved from paper analysis through detailed war games, major operations, including coordinated air, surface, and submarine forces, indicated that in the event of conflict the Navy could prevail against the Soviet Navy. Demonstrated advantages over Soviet submarines gave confidence that U.S. submarines working independently or in associated support would prove critical for the carrier battle groups as well as for interdicting Soviet naval surface forces.[7]

While the *Los Angeles*-class submarines deploying in the late 1970s were markedly superior in performance to the *Sturgeon*s that were the backbone of the Submarine Force, interest in improvements continued. Group Tango, a group of senior submarine officers assembled by Deputy CNO for Submarine Warfare Vice Admiral N. R. Thunman, continued reviewing the research and development related to new submarines. Principles considered were quieting, speed, all-digital sensor/combat system, large weapon loads, and special features for Arctic operations. Chief among the goals was to restore the generous acoustic advantage previously held and to do so at a higher speed. Attempts to quantify the speed requirement, as before, came to naught though the desirability of a higher speed was clear: e.g., rapid repositioning, high search rates, and counterattack evasion. "The purpose of this ship," said Admiral Kinnaird McKee, then-Director of Naval Warfare on the staff of the Chief of Naval Operations, "is to place in the mind of a potential adversary an overwhelming uncertainty as to the eventual success of his strategic plan."[8]

In July 1978, Admiral Hayward became CNO, and the Navy's shift to offensive posture became general. This stance was characterized in classified discussions as "early, global, forward, offensive, joint, and allied." The scenario discussed was a protracted, mostly conventional war, centered in Europe but global in nature. The plan aimed not only to gain sea control throughout the world ocean, but also to project naval power all around the Soviet periphery. Proponents saw the latter as altering the Soviet correlation of forces, limiting concentrations of tactical air forces, and preventing exclusive focus on the Central Region. While the original ideas included strikes from the sea on the Soviet homeland, anti-ballistic-missile submarine operations were not contemplated.[9]

A number of movements and activities came together after 1980 that created the optimum conditions for expanding and publicizing this strategy. Chief among these was the new Reagan administration's focus on expanding American defense posture. Secretary of the Navy John Lehman led the call for a larger Navy. The proponents of the Maritime Strategy were "pushing on an open door."[10]

At-sea experience with new and improving weapon systems and advanced exercises laid the groundwork for a feeling of confidence within the officer corps. The Global War Game at the Naval War College initiated in 1978 marked a wider examination of the purpose and execution of an armed conflict between the West and the Soviet Union. Hayward encouraged this intellectual ferment in the OPNAV Staff, at the War College, and especially with the establishment of the Strategic Studies Group (SSG) at the War College in 1982.

This organization, six senior captains and two colonels under the direction of former Under Secretary of the Navy Robert Murray first addressed the ASW campaign. Torpedo logistics was a major issue in their analysis. While there were enough torpedoes to rearm 30 percent of the submarines, getting this ammunition to the forward areas would be tedious and risky. Increasing the submarine magazines addressed both of these operational difficulties.[11] In addition, attacks on the Soviet Surface Action

Groups would roll back their outermost air defenses, permit operation of maritime-patrol aircraft, open paths for bombers, complement efforts to control the air over northern Norway, and allow surface forces to attack the Soviet northern flank. These concepts broadened the plans to emphasize the joint and coalition nature of this maritime focus.[12]

Finally came the recognition that the Soviets planned to use their navy to provide what they called *combat stability* to their ballistic-missile submarines. Their new longer-range submarine-launched ballistic missiles enabled their SSBNs to operate near the Soviet homeland, where they would be easier to protect. While recognition of this essentially defensive Soviet naval strategy began with a number of analysts and intelligence professionals during the 1970s, the idea was internalized by Navy leadership as a result of a unique intelligence source that provided exceptional insights into the thinking of the Soviet naval leadership and by extension into the thinking of their overall military leadership. In 1981, guided by intelligence specialist Richard Haver's interpretation of the information from this source, VCNO Admiral William Small chaired a group of senior officers to examine how best to exploit this information. This Advanced Technology Panel (ATP) examined the implications for the Navy and its desired aggressive strategy.

Haver preached the gospel of Soviet bastions. Most senior officers had rejected this theory because such a defensive mentality was contrary to their preferred course of action, but Haver was remarkably effective. Threatening both Soviet SSBNs and the forces protecting them quickly became the internal Navy preference and ultimately reflected in those operational plans the Navy controlled. In addition to the desire to take the fight to the enemy, this strategy would prevent the Soviets from shifting their naval effort to interdicting the sea lines of communication by keeping their general-purpose forces tied down in a protective role. The strategy was tested in a series of war games in 1982 and 1983. At this stage nuclear weapons were largely ignored. The Navy leadership was reluctant to say anything explicit about

actually attacking Soviet SSBNs, fearing — correctly — that there would be a backlash from outside the Navy.[13]

The Navy's expert on nuclear warfare in 1982, Captain Linton Brooks, worried about the escalatory aspects of the strategy. Brooks embraced the classic nuclear-stability view that if both superpowers had survivable second-strike forces, nuclear war was less likely. The corollary was that attacks on strategic forces prior to nuclear use invited escalation.[14] The ultimate answer to this quandary was a practical calculation. Expecting U.S. submarines inside the Soviet bastions to be able to selectively avoid attacking SSBNs was unreasonable. Accepting the assault on Soviet bastions meant accepting assault on all the targets, surface and submarine, within them.

Attacking SSBNs was the most prominent but not the only nuclear issue. Aggressive use of carriers near the Soviet homeland raised questions about inviting nuclear counter-attack. Nuclear war at sea would favor Soviet interests. Navies were vastly more important to the West than were the Soviets' to them. Initial drafts of the strategy did not consider this risk. Ultimately, the ATP concluded that the Soviet General Staff had a land-campaign focus and that there was little or no chance that the Soviet Navy would be allowed to cross the nuclear threshold. In an instance of national policy reflecting this concern, the Secretary of Defense's annual posture statements included language that the United States would not permit a nuclear war to be confined to the sea.[15]

Over time, people outside the Navy became aware of the existence of this strategy. In 1982 and 1983 the strategy was briefed extensively within the Navy and to Congress without explicitly discussing attacking SSBNs. The implications were obvious, however, and a backlash began outside government. While never detailed as a resource issue, the words were used to open the Navy budget presentations and thereby linked to Lehman's calls for a 600-ship Fleet. Objections followed on resource grounds, opponents preferring to spend on ground and air forces in Europe. While the presentations describing the strategy did not discuss attacking SSBNs, such an implication became obvious and concerns about such attacks on Soviet strategic arms

generated a backlash outside the government from those who raised the fears of nuclear escalation or questioned the relevance of the Navy's plans in deterring the Soviet Union."

Professor John Mearsheimer attacked the strategy at a Navy War College conference in 1985. Brooks was present but bothered by the lack of unclassified material to defend the strategy. At his suggestion, the new CNO, Admiral James Watkins, agreed to put his name on a defense of the strategy written by Captain Robby Harris with some input from Brooks and subsequently published in *Proceedings.* Brooks also wrote a defense in the scholarly journal *International Security* in late 1986. By that point the anti-SSBN aspects of the strategy were accepted within the Navy and being defended publicly.

This document was directed at two audiences: internally as a statement of direction and externally at the leadership of the Soviet Union to indicate that in the event of war, the maritime related and geographically located bases and centers would be subject to direct assault by the U.S. Navy, e.g., attacking the Soviet Union's submarine-based ballistic-missile forces. Later the Soviets admitted they had long expected us to attack their SSBNs.[16]

The strategy never gained traction outside the Navy, and the nuclear aspects began to lose influence within the Navy following the departure of Watkins. Although no one working on the strategy foresaw it, by 1989 the Cold War had effectively ended. In 1991 the Soviet Union itself had vanished, and the remnants of the *Maritime Strategy* disappeared with it. But it would be wrong to say the strategy had no long-term effect. At the end of his *International Security* article Brooks wrote that the strategy's "long-term legacy, perhaps the most important of all, is the forging of a new professional consensus on . . . the importance of systematic thought and study."

The contract for the SEAWOLF was awarded in January 1989, and her keel was laid on 25 October. Launched on 24 June 1995, she is the fastest submarine in the world with noise levels substantially below that of her predecessors, even at high speed. The ship's size allowed larger hydrophone arrays that vastly increased the search area and search rate. Her magazine capacity

was more than twice her predecessors', fulfilling Watkins' direction that the SEAWOLF have a large weapon load because "if the war came there would be no going back to New London for reloads."[17] She is also capable of operations under ice. Only three ships of the class were authorized and built, but many of the advances were incorporated in the following class, the *Virginia*.

The acquisition of ships, ship systems, and aircraft is a succinct statement of the country's strategic interests as seen by the U.S. Navy. Such is an unambiguous statement of the Navy's beliefs, aims, and ambitions. The supporting research-and-development programs are an even longer-term expression of strategic interests. As shown in the Seawolf conceptualization, the service's long-term strategic interests may be only peripherally related to a particular administration's stated national policy, and indeed national policy may come to follow the service's lead.

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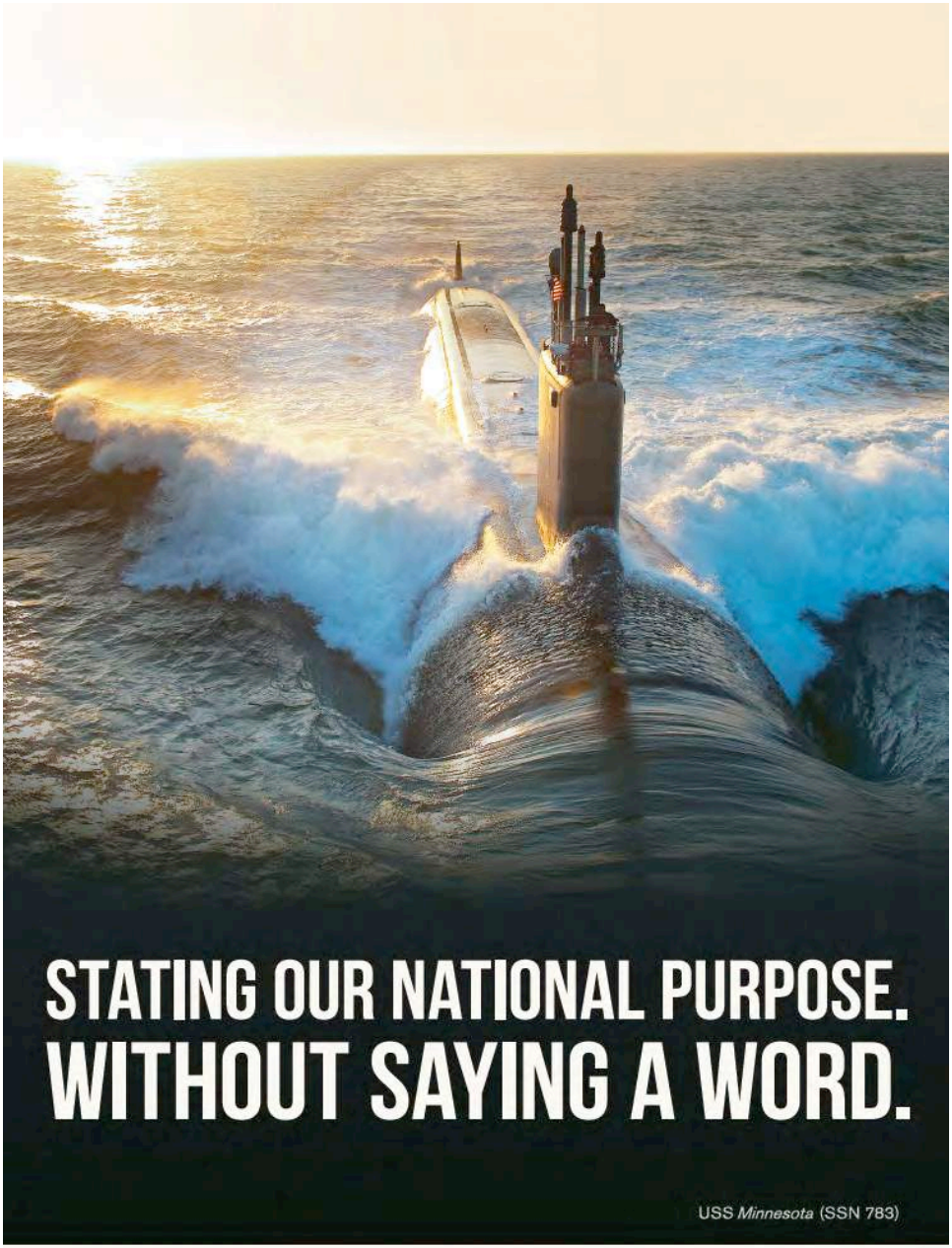

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NAUTILUS — FROM DREAMS TO REALITY

by Dick Brown, Former ETR2(SS)

"What one man can conceive, another man can achieve." — Jules Verne, 1873

"It was the skipper's intention to surface at the North Pole, but there was no break in the ice."
— CAPT Shepherd M. Jenks, USN, Ret., Navigator, USS NAUTILUS (SSN-571) — North Pole Transit, 1958

NAUTILUS Lineage

From the Greek word *nautilos*, meaning mariner, many vessels shared the name *Nautilus*, some long before the fictional *Nautilus* surfaced in Jules Verne's *20,000 Leagues Under the Sea*.

The first was Robert Fulton's *Nautilus*. His submarine design was patented in France in 1798. His prototype had a collapsible mast and sail for surface propulsion and a hand-turned propeller for underwater propulsion. Before USS NAUTILUS, there were five U.S. Navy vessels by the same name. Two were sailing ships, a 12-gun schooner, commissioned in 1803, and another schooner, commissioned in 1847 for service in the Mexican-American War.

There was a Holland-class submarine prototype originally named NAUTILUS at keel-laying that became USS H-2 (SS-29) in 1911. There was USS NAUTILUS II (SP-559), a motor patrol boat, commissioned in 1917 for WWI service and there was an old diesel-electric boat, the decommissioned *O-12 (SS-73)*, that was converted for use by the ill-fated 1931 Wilkins-Ellsworth Trans-Arctic Expedition and renamed *Nautilus* in honor of Jules Verne.

USS NAUTILUS (SS-168), a Narwhal-class diesel boat, saw WWII action in the Battle of Midway. Due to her large size, she was outfitted as an undersea troop carrier, landing Marines in the Gilbert Islands in August 1942 and again in November 1943 and putting scouts ashore on Attu in the Aleutians in May 1943. All in

all, she made fourteen war patrols. The Royal Navy had eight sailing ships, a destroyer and a submarine named NAUTILUS but that's another story.

Jules Verne's Fictional *Nautilus*

In 1871, Jules Verne published the French edition of *Vingt Mille Lieues Sous Les Mers* — the classic adventure of Captain Nemo's *Nautilus* submarine. The British edition of *Twenty Thousand Leagues Under the Sea* followed two years later. Today, onboard the NAUTILUS (memorial museum) is a first edition of the novel; it was also onboard during the submarine's historic North Pole run.

Verne's concept of a submarine was prophetic. He envisioned a high-speed, deep-diving vessel that could travel under polar ice. He saw stealth as the key to secret military operations. His submarine theme was inspired by the ongoing work of pioneer submarine designers as well as exhibits at the 1867 International Exposition in Paris where Verne witnessed progress in developing diving suits and other mechanical marvels. He was highly influenced by the discovery of electricity as well as a model of the French submarine PLONGEUR. But it was Robert Fulton's primitive *Nautilus* of 1800 that inspired the name for Captain Nemo's submarine. It naturally followed that the world's first nuclear-powered submarine should also carry the name *Nautilus*.

In nautical terms, a league refers to a measure of distance traveled at sea, not to a measure of operating depth. At the time of Verne's writing, no submarine could travel one league, let alone the fabled 20,000. Regardless, as Verne's story goes, it was deep in the Pacific where a frigate encounters a *giant sea monster*. During the ensuing attack, three men are thrown into the sea and promptly captured by the steel beast. The story follows their undersea adventures aboard the *Nautilus*, a secret electric submarine. Wandering the seas, seemingly in exile, Nemo directs *Nautilus* on a series of global adventures.

The mythical voyage starts in Japan and crosses the South Pacific and the Indian Ocean before venturing into the Red Sea. From there it traverses the Suez Tunnel, an underwater passage

connecting the Red Sea to the Mediterranean Sea. *Nautilus* then visits the submerged land mass known as Atlantis, cruises in the South Atlantic and even noses up to the ice shelf in Antarctica, then reverses course, following the eastern seaboards of South and North America. The voyagers are attacked by a giant squid, walk along the sea floor with special air-breathing backpacks, and sink a marauding warship by ramming. They then cross the North Atlantic and are sucked into the Maelstrom off the coast of northern Norway. The three prisoners escape but the fate of the *Nautilus* and Captain Nemo remains unknown until the end of Verne's sequel novel, *The Mysterious Island*.

Verne's electric-powered *Nautilus* displaced 1507 tons compared to our Navy's nuclear-powered NAUTILUS displacing 4092 tons. The mythical submarine had a double hull, a length of 230 feet, a beam of 26 feet and a draft of 24 feet. The real-life *NAUTILUS*, with a single hull, is longer at 324 feet but nearly matches Verne's beam and draft at 28 and 26 feet, respectively. Both had floodable tanks and hydroplanes. Where they greatly differed was in test depth—an astounding 52,490 feet for Verne's submarine. Crew complement also differed—only 20 or so for Verne's *Nautilus* compared to 116 for USS NAUTILUS. Armament was simply a sign of the times–ramming at collision speed of 50 mph for Verne's boat, six torpedo tubes for USS NAUTILUS.

Walt Disney's first science fiction movie, *20,000 Leagues Under the Sea*, is probably the best known of the many screen adaptations of Verne's novel. Less than a month after release of the movie, the real captain, CDR Eugene P. Wilkinson, of the real NAUTILUS radioed *"Underway on Nuclear Power"*. NAUTILUS became the technological turning point in propulsion beneath the waves—the vanguard of a new age in undersea warfare.

The pioneering submarine designer Simon Lake was inspired by Jules Verne's *20,000 Leagues*. His first operational submarine sailed from Norfolk to Sandy Hook, New Jersey, a distance of 120 leagues. Oceanographers Robert Ballard, William Beebe and Jacques Cousteau were also inspired by Verne, as were CAPT

Hyman G. Rickover, an immigrant from the Czar's Russian empire, destined to become a 4-star admiral and *Father of the Nuclear Navy*, and an enterprising young naval officer, LT Shepherd M. Jenks.

NAUTILUS Navigator

When LT Shepherd *Shep* Jenks reported aboard USS NAUTILUS in 1956, he was originally assigned as the Engineer but then CDR William R. Anderson, Commanding Officer, made him the Navigator. It was a challenging role, especially when NAUTILUS embarked on the first-ever cruise under the North Pole. When we celebrate the 60th anniversary of the commissioning of the submarine in September 2014, Shep Jenks would have celebrated his 88th birthday. Sadly, he passed away on March 26, 2014

Shep graduated from the United States Naval Academy, class of '49. After Submarine School in 1952, he was transferred to the USS BLACKFIN (SS-322) where he qualified in submarines. He was accepted into Nuclear Power School in 1955. He served aboard NAUTILUS from 1956 to 1958.

Operation Sunshine

In the late 1950s, the Cold War was heating up; we were beginning to build ballistic missile submarines; the International Geophysical Year—man's most ambitious study of his environment—was well underway; A-bombs were being detonated in the Nevada desert; and the United States was caught flat-footed when USSR launched Sputnik-I (Russian for *fellow traveler*) in October 1957. The launch of Sputnik-II a month later caused great concern with predictions of imminent disaster for the Free World. Of course the worry was that if the Soviets can put satellites in space, they may soon be able to fire a nuclear-armed ballistic missile at the United States. The space race was on but the U.S. program was sputtering over USSR's sputniks, as evidenced by the embarrassing, but highly televised, launch pad explosion of Vanguard in December 1957.

Reacting to the psychological impact of the Soviets placing two satellites in orbit, President Dwight Eisenhower directed the U.S. Navy to plan an undersea transit of the Arctic Ocean by the world's first nuclear submarine. He felt such a feat would enhance the credibility of the United States. Looking back, Shep recalls, *"I think the President wanted to reassert our position as a world power, but the main reason was to prove that we could transit to the North Pole by submarine."* Indeed it was most important to determine if the Arctic could be exploited to our strategic military advantage, especially in view of the emerging threat of ICBMs.

Officially, the White House called for *Operation Sunshine*, a misleading code name to imply a mission in warm southern waters. Furthermore, a cover story was concocted on why NAUTILUS had ventured into the Pacific. She visited San Diego, San Francisco and Seattle, ostensibly to help familiarize our Pacific forces with the advantages of nuclear submarines when in reality she was on a classified mission.

Navigation Challenges

The senior civilian scientist on the successful transpolar voyage, Dr. Waldo Lyon, had developed an instrument to help a submarine avoid ice collisions. It worked in the reverse of a fathometer, with an upward-looking sonar transducer to map the bottom profile of the icepack. Shep is highly complimentary of his civilian counterpart, the world's foremost authority on sea ice, *"Waldo Lyon was really good at his job, very intelligent."* Besides continuous use of her sonar systems and topside fathometer, NAUTILUS also conducted CCTV and periscope observations of the underside of the icepack. At that time of the year, they had continuous daylight.

And then there is the problem of magnetic compasses—they are just not reliable near the geographic pole, but instead tend to align themselves with the magnetic pole. Gyrocompasses, aligning to true north and measuring deviations from that axis, perform more reliably. But as East-West meridians or longitudinal lines converge on the pole, gyrocompasses also become erratic.

The solution was the Ship's Inertial Navigation System or SINS. Shep explained, *"We had the first SINS; it was installed aboard NAUTILUS in April 1958."* It operated independently of any reference point, except for the submarine's starting position. It was an elaborate set of electronic equipment, unlike anything then in use. With it, the navigation team, which consisted of the navigator and four enlisted quartermasters, created a virtual map of the voyage from start to finish.

If NAUTILUS had depended on standard navigation equipment at the time, it could have become so confused that it risked traveling in circles or veering off on the wrong longitudinal tangent—a phenomenon the crew called *longitude roulette*.

Although impressed with SINS, the skipper had reservations, at least initially. Being new technology, he proceeded with considerable caution, minimizing the number of changes in course, speed, angle and depth, so as not to confuse SINS. As submariners of the late 50s and 60s will remember, there was a saying about SINS: *If you tell it where it is, it will tell you where you are.* As unproven as it was, this revolutionary navigational tool contributed greatly to the success of the mission.

Setting a Course for the North Pole

As the Navy continued to gain more operational experience with its first nuclear submarines, it came time to test their capabilities in the Arctic. By early February 1957, NAUTILUS undersea warriors could boast that their submarine had already steamed 20,000 leagues under the sea. In fact, they were so giddy about the submerged endurance capabilities of nuclear submarines that some jokingly stated they planned to surface every four years to re-enlist.

On August 19, 1957, NAUTILUS departed Groton on a classified mission. Ten days and a submerged run of 4000 miles later she rendezvoused with the conventional submarine USS TRIGGER (SS-564) in the north Greenland Sea. Before approaching the icepack, she practiced vertical ascents at zero-speed, and then made her first exploratory probe under the ice. At 81-degrees North latitude, NAUTILUS found open water, but

overshot the mark and slammed into the ice, bending back both periscopes and damaging the leading edge of the sail. She was now optically blind, but managed to return to TRIGGER waiting at edge of the icepack. The crew, despite high seas and bad weather, straightened and repaired no. 1 scope but no. 2 was a total loss.

On a second excursion under the icepack in early September, NAUTILUS reached 87-degrees North—180 miles from the North Pole—further north than any ship had ever ventured. On that run she lost both gyrocompasses and in turning back she lost her way. Surfacing was not an option. By September 6th, TRIGGER was about to report NAUTILUS past due. Happily she showed the next day. TRIGGER then made a few short runs under the icepack and *Nautilus* made one more on September 8th. NAUTILUS then joined NATO's naval exercise — *Operation Strikeback.*

Despite navigation system failures and periscope damage, NAUTILUS collected valuable scientific data on polar conditions and ocean depth for future Arctic operations. While Pentagon officials dribbled some details of the Arctic expedition to the news media, NAUTILUS ice operations were soon overshadowed by Sputnik news which in turn provided even more impetus for a transpolar voyage.

In June 1958, NAUTILUS departed Seattle with top secret orders to conduct *Operation Sunshine*, the first crossing of the North Pole by a ship of any kind. Ten days later, she passed through the Aleutians, gateway to the Bering Sea and the Arctic Ocean. She transited the Bering Sea and entered the Chukchi Sea, but was forced to turn back to Pearl Harbor due to a combination of giant ice stalactites hanging above the sail and shallow water below the keel—with fifty-two feet from the top of the sail to the keel, there was not much water space left for safe submarine operations. Shep points out, *"We turned around not only because of insufficient safety margin for maneuvering, but because we did not have reliable charts."* In an emergency, the skipper was prepared to use torpedoes to blast a hole in the ice if NAUTILUS**,** which did not have a hardened sail, needed to surface quickly.

During the layover at Pearl Harbor, waiting for the Chukchi ice to thaw, Shep, posing as a DEW Line Inspector from the Pentagon, anything but a submariner, conducted many aerial reconnaissance flights over the icepack aboard a P2V, ironically, a submarine hunter operating out of Fairbanks. Shep explained, *"I flew over the icepack to study the ice and look for holes."* He gathered vital information that allowed *NAUTILUS* to embark on a second attempt. The layover also provided an opportunity for the crew to brief our Pacific Forces at Pearl Harbor in the ways of the Nuclear Navy.

In a way, the misleading mission name, *Operation Sunshine*, really did apply for a time, as the boat waited more than a month in warm Hawaiian waters. Shep finally observed dramatic improvements in ice conditions. It was July 23, 1958 when NAUTILUS quietly slipped away in the night, bound for the Arctic and a secret west-east transit under the North Pole.

Transpolar Track

CDR Anderson, well aware that Washington was anxious to make headlines, suspected that there were plans for an Atlantic-side run to the pole by the nuclear submarine USS SKATE (SSN-578)—a race of sorts to the North Pole. After all, NAUTILUS had her chance, now it was SKATE's turn, and she would have the benefit of data collected by NAUTILUS the previous year. As it turns out, SKATE suffered propeller damage in a collision with USS FULTON (AS-11) and did not leave until July 30th.

On July 27th, at a point where the 170-degrees West meridian crosses the Aleutians, NAUTILUS passed a group of volcanic islands to starboard with the name *Islands of Four Mountains*—seemingly ripped from one of Jules Verne's novels. To port was Yunaska Island. Here NAUTILUS reached a new milestone, having now traveled 40,000 leagues.

NAUTILUS threaded her way through the Bering Strait between Siberia and Alaska where the depth averaged a mere twenty fathoms. The crew was not too worried about being detected by the Soviets. According to Shep, *"We were sure they did not patrol that area."* Now in the shallow Chukchi Sea and

just above the Arctic Circle, NAUTILUS surfaced and spent two days searching for deep water at the edge of the icepack along Alaska's northern coast.

Just off Point Barrow on August 1st, NAUTILUS submerged, turned due North and started her long historic run to the geographic North Pole. This was a straight run under the ice along the 155-degrees West meridian through uncharted waters. Shep explains that they were able to do some mapping of the ocean floor, *"That was one of the reasons we made the trip. I don't remember discovering any underwater mountain ranges or canyons. It was basically a flat bottom."* Actually, bathymetric readings across the Arctic Basin showed depths plunging to 2100 fathoms between 72 and 74-degrees North latitude, then depths ranging between 500 and 2000 fathoms to the Pole. Shep was rather surprised about their soundings in the Arctic Basin. *"It was very deep!"* he recalled. Admittedly, there were some underwater mountain ridges that rose quite suddenly, giving pause to the quartermasters hovering over the plotter and causing the officer of the deck to order reduced speed.

About 1000 yards from the Pole, the skipper addressed the crew on the 1MC: *"All hands, this is the Captain speaking, in a few moments NAUTILUS will realize a goal long sought by those who have sailed the seas . . . standby, 10, 8, 6, 4, 3, 2, 1, mark — for the USA and the U.S. Navy—the North Pole!"* The submarine reached 90-degrees North latitude at 11:15 pm (EDT) on August 3, 1958 but continued her arrow-straight course along the 155-degree meridian, now headed due south. Shep reports, *"It was the skipper's intention to surface at the North Pole, but there was no break in the ice."* As tempting as it was, the skipper decided not to risk confusing his navigation gear by looking for a place to surface. As NAUTILUS zoomed under the Pole at 20 knots and 400 feet, the fathometer measured the depth at 2235 fathoms or 13,410 feet!

Shep does not remember any celebration when they reached the Pole, probably because he was busy in the control room, but the skipper read a letter he had composed for the President to ship's company crowded into the crew's mess. In the back of his

mind, the skipper worried that SKATE could have reached the pole before them and was on her way back. There was no way of knowing.

It is interesting to note, while NAUTILUS crossed under the pole, a half-century earlier, RADM Robert Peary, USN crossed over the pole. He traveled over the pack ice by dogsled and reached the geographic North Pole on April 6, 1909.

After another day, NAUTILUS adjusted her southerly course to follow along the Greenwich Meridian into the Greenland Sea. By August 5th she was proceeding south between the northern extremities of Greenland and Spitzbergen. After traveling 1830 miles under the ice, NAUTILUS finally surfaced northeast of Greenland to radio CNO Admiral Arleigh Burke a simple but historic message "NAUTILUS 90 North". On August 7th, between Iceland and Greenland, NAUTILUS passed SKATE heading north. Five days later, SKATE reached the pole and surfaced in a polynya (area of thin ice or open water), becoming the first to break through the icepack at the North Pole.

Meanwhile, NAUTILUS angled southwesterly through the Denmark Strait between Greenland and Iceland and made a slight jog toward Reykjavik so that the skipper could board a helicopter and make his way to Washington where he participated in a press conference and a briefing for President Eisenhower on the success of *Operation Sunshine*.

During the White House visit, an event that inadvertently failed to invite RADM Rickover, CDR Anderson was awarded the Legion of Merit by the President for pioneering a "Northwest Passage", albeit, a submerged sea-lane, from the Pacific to the Atlantic. Later, the entire crew was awarded the Presidential Unit Citation, the first peacetime bestowing of such honors. Meantime, with Executive Officer LCDR Frank Adams in command, NAUTILUS made a beeline for the British Isles where the skipper rejoined his boat.

An Extraordinary Naval Career

Shep, by then a rising star in the Submarine Force, was the commissioning engineer on USS GEORGE WASHINGTON

(SSBN-598) in 1959 and onboard during the first Polaris ballistic missile firing. He was second in his PCO class; his good friend and NAUTILUS shipmate LT John W. Harvey finished first and was assigned as CO of the USS THRESHER (SSN-593). Unfortunately, Wes Harvey perished when THRESHER went down with all hands on April 10, 1963. Shep became the CO of USS SKIPJACK (SSN-585) in 1963, CO of Nuclear Power Training Unit at West Milton, NY in 1964, CO of USS ABRAHAM LINCOLN (SSBN-602) in 1968 and CO of the submarine tender FULTON in 1970. He retired in 1971 with the rank of Captain. After working for Bechtel for ten years, Shep had a new calling and became an ordained deacon in the Episcopal Church. Reverend Jenks performed funeral services at Arlington National Cemetery for retired RADM Richard O'Kane, WWII Medal of Honor recipient, in 1994 and for retired CAPT William Anderson, his former commanding officer of NAUTILUS, in 2007.

Shep Jenks was a longtime member of the Naval Submarine League and the Navy League of the United States. He served on the Navy League's USS New Mexico Committee in the early days, when he and wife Nancy lived in Albuquerque, and delivered the invocation at the naming ceremony with Secretary of the Navy Gordon England in December 2004. Shep and Nancy then moved to Vallejo, California.

As an aside, this past March, the Groton-based USS NEW MEXICO (SSN-779) participated with the San Diego-based USS HAMPTON (SSN-767) in ICEX 2014. Such Arctic exercises help prepare our Submarine Force for a wide range of operations in a most challenging environment. The base of operations for ICEX 2014 was Ice Camp Nautilus, 200 miles north of Prudhoe Bay. ICEX 2014 assures continued access to the Arctic region and hones the skills of our submarine crews as they transit between the Pacific and Atlantic Oceans.

Epilogue

CDR Bill Anderson, whose strength was in giving his shipmates all the credit, considered the work of Shep and his team to

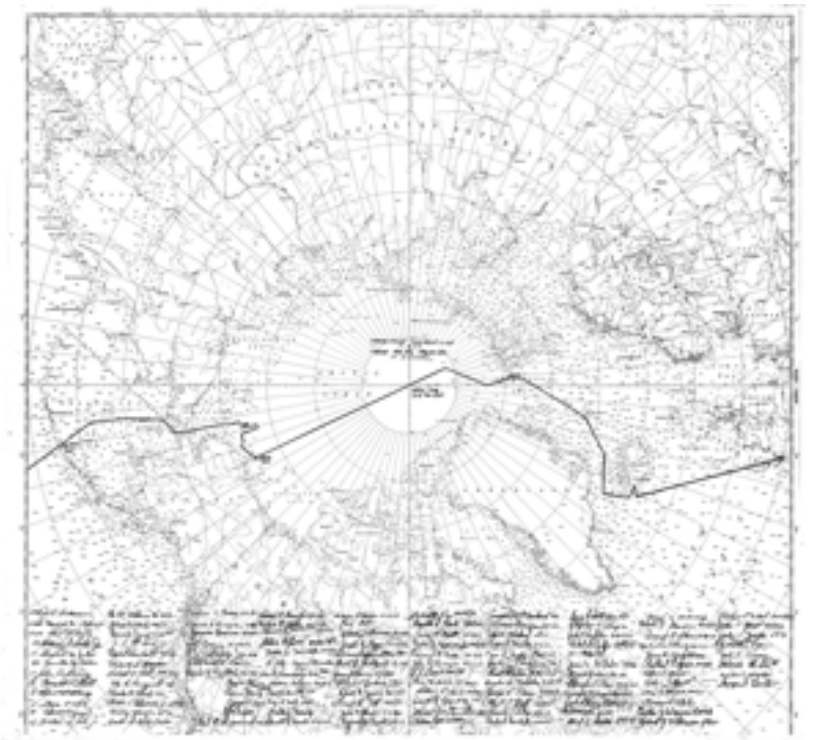
be the most remarkable piece of nautical navigation ever accomplished. In the absence of nautical charts, taking star sightings, shooting bearings on landmarks, exchanging electronic transmissions, or viewing what lay ahead through a window like Verne's NAUTILUS, the first submerged Arctic crossing was indeed remarkable. Years later, Shep reflected, *"Our navigation team, by the grace of God, had individual personalities and gifts that perfectly fit the challenge we had on each of the voyages north"*. Jules Verne once wrote *"My readers are my passengers and my duty is to ensure that they are properly treated during the voyage and satisfied on their return"*. Shep shared this sentiment. Safety of the crew was paramount and his careful navigation under the ice led to the safe return of NAUTILUS.

Polaris—the North Star—that holds steady as the northern skies circle around it, has guided sailors across the oceans for centuries. While Polaris was not available to assist Shep and his team, it was there in spirit, and it continued to play a significant role in Shep's naval career—first Polaris ballistic missile submarine—first Polaris missile firing—first Polaris strategic deterrent patrol. CAPT Shepherd Jenks—a legend in the submarine community—saw dreams of early science fiction become a real-life ocean-to-ocean journey beneath the North Pole.

Note: The author thanks CAPT Shepherd Jenks, USN, Ret. for his valuable contributions to this article. Other contributors include Al Cole, Vice Commander of USSVI's Mare Island Base, who served aboard USS TINOSA (SSN-606), USS SKIPJACK (SSN-585) and as COB on USS SEAWOLF (SSN-575); LCDR Ray Raczek, USN, Ret. who was the Reactor Control Division Chief aboard NAUTILUS on the 1957 polar run; and NAUTILUS Plankowner LCDR Tom Brames, USN, Ret.

About the Author: *Dick Brown served when our Submarine Force was transitioning from diesel-electric to nuclear propulsion and from Regulus to Polaris missile strategic deterrent patrols. He qualified on USS BARBERO (SSG-317)*

while on patrol in the Bering Sea, and was on the launch crew for the nuclear-tipped Regulus cruise missiles that BARBERO carried. He made four patrols on USS LAFAYETTE (SSBN-616) as a member of the Reactor Control Division. He currently chairs the Navy League's USS NEW MEXICO Committee.



Nautical chart showing the west-to-east transpolar track by USS NAUTILUS in 1958, signed by most of ship's company plus four civilian engineers and scientists.

WE NEED MARITIME *DOMINANCE*, NOT JUST AWARENESS SIZING THE SUBMARINE FORCE – ISR WITH TEETH

by Capt Jim Patton, USN, Ret.

Captain Patton is a retired submarine officer who is a frequent contributor to THE SUBMARINE REVIEW.

We should have a good navy, and our sea-coast defenses should be put in the finest possible condition. Neither of these cost much when it is considered where the money goes, and what we get in return. Money expended in a fine navy, not only adds to our security and tends to prevent war in the future, but is very material aid to our commerce with foreign nations in the meantime.[1]

Ulysses S. Grant
President of the United States 1868-1876 and
Commander of Federal Forces during the Civil War

Background

Arguably the ablest combat commander the United States has ever produced seemed to have it right in the above words written just months before his death. His views at the time, understandably, were on a continental scale, and it would take another two decades for them to be expanded into a global scale by Teddy Roosevelt, the Panama Canal and the "Great White Fleet". In addition, General Grant was present for, and certainly participated in, what had to have been until that time the "mother of all Base Realignment and Closure (BRAC) and Quadrennial Defense Review (QDR) processes" as his nation's military spooled down from a tragic four-year internal war that resulted in about 600,000 American casualties. It is telling that he ended both his book and his life convinced that it is a peacetime investment in a strong navy that best protects a maritime nation from crippling wars. Five years later this same view would be independently and more extensively captured in Mahan's *The Influence of Sea Power upon History, 1660-1783*.

The other major national security event that Grant certainly observed and probably had a hand in was the emergent need on our western frontier to patrol, monitor and protect U.S. citizens and interests across vast, sparsely settled areas. Doing this with minimal forces which possessed mobility and endurance and limited logistic needs fell disproportionately to the cavalry arm of the U.S. Army—whose naval equivalent are SSNs.

What relevance do Grant's views have for today's force planners? As the Pentagon shifted its emphasis from *traditional* to *irregular* combat in a recent QDR, there were similarities to what Grant experienced between 1865 and 1885. The threat of major conflict had lessened, but still had to be considered and guarded against, and in its place a new *asymmetrical* set of insurgencies and contingencies has risen. As this planning process moved into high gear, the concept of dominance across the *Strategic Commons*[2] gained considerable support.

Discussion

Four potential security *focus areas* that those who conducted the QDR had to consider were:

- A global Jihadist Insurgency
- Homeland Defense
- A Nuclear-Armed Failed State
- A Near-Peer Competitor

When the necessary traits of systems needed to deal with the daunting threat spectrum defined by these four *alternative futures* are reviewed, some characteristics enhancing the necessary *Maritime Domain Awareness* (MDA) are pervasive throughout – for example:

- Diverse intelligence gathering capabilities
- Littoral capabilities
- Special Operations Forces (SOF) capabilities
- Agility

Other desirable system characteristics supporting what could be called *Maritime Domain Dominance* (MDD) are specific to some, but not all of the focus areas:

- Long range precision strike
- Access-insensitive to denial efforts
- Ability to impose sea denial

From a submariner's perspective, the characteristics described above all but define the breadth of attributes that multi-purpose nuclear attack submarines (SSNs) have demonstrated to a high degree of proficiency through exploitation of their enduring qualities of *Stealth, Mobility, Firepower and Endurance*.[3] It is intriguing to consider the economies of effort obtained when the same platform that performs superbly as a provider of MDA is also a principle source of MDD. If credence is given to the future submarine probably having additional multi-mission capabilities of being a close-in magazine from which to launch expendable UAVs, fire land-attack tactical ballistic missiles and fire remotely tracked and targeted Anti-Theater or Anti-Intercontinental Ballistic Missile (ATBMs/AICBMs) interceptors, then the brush of submarine utility paints an even wider swath across the set of all possible maritime futures.

Maritime Domain Awareness – what is it?

Essential to executing the role of the dominant sea power is a pervasive knowledge and awareness of what is traversing these *maritime commons*. Space-based platforms and patrol aircraft certainly contribute to this requirement, but being *noticeably* observed serves to alter the behavior of those with something to hide. For example, the first *hard* evidence of Soviet shipping of advanced military hardware to Cuba in 1962 was obtained through the periscope of an SSN, cued onto the merchant ships by naval patrol aircraft who had seen and photographed nothing but canvas covered deck cargo—canvas covers that had been temporarily taken off when it was thought no one was looking. More recently, when a merchant ship in the Aegean during the Kosovo affair declared a *Mayday* and turned towards the Dalmatian coastline,

the trailing SSN was able to inform NATO authorities ashore that it was a hoax, and in about 45 minutes SOF were *fast-roping* down from a hovering helicopter to commandeer the ship and its cargo of military contraband. The proper execution of MDA operations will frequently require this type of covert surveillance and coordinated jointness.

As indicated above, MDA is and will continue to be a critical component of all alternative futures, and an essential element of MDA is and will continue to be Intelligence, Surveillance and Reconnaissance (ISR). Of particular interest is that in spite of having force levels reduced by one-half over the last two decades, the actually ISR taskings for the Submarine Force in the *Future Security Environment* have doubled. This 400% increase in per-unit ISR workload is stretching force assets thin, and has resulted in many high-priority taskings not being accepted for execution.

Submariners are quick to state that ISR has really been their primary mission since the end of WWII, and some insights have just recently come to public light of just how important these missions were to the successful conclusion of the Cold War. Not as apparent or intuitive is that in addition to having been a *provider* of MDA from international waters close to the Soviet Union, the Submarine Force was a significant *user* of MDA from other sources. Whereas such as *The Hunt for Red October* would have one believe that U.S. SSNs were always in just about the right place to detect and trail a Soviet submarine, what would more likely happen is that space-based assets would cue the Sound and Surveillance System (SOSUS) that a submarine had left home port, SOSUS would detect and cue Maritime Patrol Air (MPA) into an area the size of Colorado, MPA would detect and cue the submarine into the right county, and the SSN would detect and localize to a specific street address.

Maritime Domain Dominance – how is that different?

At times decisive offensive action or the credible threat of such will be required in support of each of the four focus areas under discussion. Having sufficient ISR to identify a threat is one thing—responding to that threat with appropriate force when

necessary is another. It wasn't all that long ago that it came to light that some enterprising people in the CIA had opted to fit some of the *Predator* UAVs in Afghanistan with *Hellfire* missiles, greatly simplifying the *sensor-to-shooter* equation when a valid, engageable target was found. The SSN, with it's extensive ISR package and formidable weapons load takes the term *armed reconnaissance* to a new and novel naval high, capable of both protecting friendly Sea Lines Of Communications (SLOCs) and attacking those of the enemy by survivably engaging not only surface and submarine targets it detects and develops, but also *servicing* time-critical aim points for strike ashore as directed by external sources.

In the SSBN trailing scenario discussed previously, the first bit of MDA was provided by space assets—SSBN pendant number XYZ is no longer in homeport and is therefore in the open ocean. This was a valuable and enabling piece of information, but the space asset was unable to act upon it other than to pass it on to SOSUS. Similarly, after SOSUS refining it, the better data was employed by MPA who, under peacetime conditions and without committing disproportionate assets, further refined it and was able to provide a limited degree of non-persistent MDD through deterrence and dissuasion. The really telling MDD was created, however, when MPA then cued the SSN into contact to provide a persistent presence with a credible 24/7 threat to the SSBN for an entire patrol cycle.

As for SSNs continuing to provide not just MDA, but also MDD for the four QDR focus areas, consider that when in coming years the best interests of the U.S. are served by a naval presence in a littoral that has a degree of Anti-Access/Access-Denial (AA/AD) established, the *first* unit(s) will undoubtedly be nuclear submarines as the only *access-insensitive* platforms in the maritime services. That these same units will also be both capable MDA and MDD assets is truly a bonus.

Submarines in the Future Security Environment

Along with persistent, covert (and armed) ISR in support of what used to be called the Global War On Terror (GWOT), SOF

insertion/extraction/support, and detection, with subsequent localization and neutralization of sea mines, these same SSN/SSGN and even SSBN platforms could in the future quite likely represent a *Remotely Operated Magazine* containing ATBMs/AICBMs to be released against an opponent's missiles having been detected and tracked by other means. After all, if nothing else, just as FORCEnet and ubiquitously available precision navigation have allowed the concentration of *force* (a key 'principle' of war) without the concentration of *forces*, they have also enabled the geographic separation of sensors and weapons—a truly disruptive technology.

Some would claim that there is no longer an *immediate* need for a U.S. naval *deep water* combat and interdiction capability, since the post-Soviet Union *peer competitor* that the QDR is tasked to plan for seems well over the horizon. It would be advisable for those to both read the introduction to John Keegan's *The Price of Admiralty*[4] and to consider the fact that China has been quietly acquiring extensive oil and gas rights in South America and Africa. Their country will need a dependable flow of fossil fuel energy if it is to continue the present rate of economic development. The impressive navy China is putting together, therefore, is likely *not* so much to intimidate Taiwan or challenge the United States, but to be able to protect their vital trans-oceanic Sea Lines Of Communications (SLOCs). Merchant ships are expensive, and what they carry more expensive still. As General Grant (later Mahan) so well noted, building navies to protect this commerce is costly, but not nearly as much so as leaving it at risk. Nature and geo-politics abhor a vacuum—there will always *be* a dominant sea power, and it is a matter of choice for the United States if we wish to retain that title.

For example there could be a requirement for the time-critical destruction of a *loose nuke* about to be employed from a rogue merchant ship—an ideal mission for a ship-killing heavyweight torpedo with near-zero risk to the crew from a nuclear *secondary* explosion. In this or other hypothetical examples, it should be kept in mind that because a nuclear submarine does not require a *critical mass* of other supporting forces to be militarily effective, a

given number of them can be widely dispersed to cover vast areas. For instance, with *Tomahawk* missiles having an effective range of more than 1000 miles it can be mathematically shown that a force of some 12-14 SSNs somewhat homogeneously dispersed throughout the world's oceans results in virtually all of the world's littoral being under this less than 2-hour strike *umbrella*. Combine that with the fact that within the next 24 hours, a given SSN could position itself so as to cover some point in an additional 4 million square miles not within the original 3 million square miles of coverage. The quickness with which a number of already deployed submarine units could then *pile on* a given location if necessary is left as an interesting issue for contemplation by the reader. When SSGNs, with 154 *Tomahawks* are added to the equation, and SSBNs with non-nuclear warheaded D5 missiles that can impact any spot on the surface of the earth within an hour of being ordered are considered, the credible *conventional* deterrent that ex-Secretary of Defense Rumsfeld spoke of seems assuredly to be embodied by a continued strong Submarine Force.

As we have watched the Russians conduct a massive BRAC/QDR-like process after 1989, one observation should be apparent. It is clear that the sine qua non of the Russian navy, the last capability they would relinquish, is the building and operation of extremely capable nuclear attack submarines such as the *Severodvinsk*—perhaps the world's second best SSN. To these arguably most logical and analytical of all people, global geo-political influence is best maintained in a *bear* military portfolio era by maintaining global *maritime* capability, and a global maritime influence is best maintained through ownership and operation of a credible fleet of nuclear submarines. It is easy to imagine that as regards the defeat of a seaborne invasion attempt, a Chinese military leader would be more unnerved by a few U.S. SSNs/SSGNs *west* of Taiwan, than a few U.S. Carrier Battle Groups to the *east* of that island. Just as a developing coastal nation's first and most cost-effective naval purchase to defend its home waters should be the best non-nuclear submarine available, the *last* warships to be cut in the Russian (or United Kingdom, French and U.S.) Navy should be the best SSNs it could build or

buy— preferably in the quantities required for a *credible round the world, round the clock* capability.

Homeland Defense versus Homeland Security

As a brief aside, it is instructive to consider what the definitions and differences are between Department of Defense (DoD)-responsible homeland *defense*, and Department of Homeland Security (DHS)-responsible homeland *security* and wonder just what are the implications of those semantics. An old euphemism used to be that "…the Coast Guard works for Treasury Department, but 'in time of war' chops to the Navy". Since that is no longer true – if for no other reason that, empirically, the U.S. *is* at war (the ex- GWOT) and the Coast Guard *isn't* working for the Navy-what will be the Navy/Coast Guard split of responsibilities in some of these contingencies? Couple this question with what appears to be a historical truth—that Navies are best employed when *deployed* and that their basic raison d'être is distant offense, not local defense,[5] and further quandaries emerge. Clearly, having an Aegis-capable ship in Sea of Japan for ascent/mid-course ATBM protection for Japan and/or ascent-phase CONUS-targeted ICBM intercept is a Navy mission. However, should the Aegis-capable ship just off the West Coast for purposes of terminal phase ICBM defense be a Coast Guard unit under the DHS?

On the other hand, the United States Coast Guard (USCG) has a rich history of operations in the littorals of not only CONUS, but also off other nations/continents—including recent operations in the Persian Gulf. Since it is inevitable that some USCG missions under the DHS will overlap to a degree with those of the Navy under the DoD, should there be a DHS-sponsored QDR of these Coast Guard missions and/or should these missions be reviewed as a part of the DoD QDR process?

Conclusions

Maritime Domain Awareness is clearly a prerequisite for Maritime Domain Dominance, and ISR is even more clearly a prerequisite for Maritime Domain Awareness. A plethora of various assets contribute to this awareness, but no other has a

degree of persistence and endurance equal to that of an SSN. Additionally and non-trivially, the fact that the SSN conducts its collection in a covert manner means that the subject of the collection is caught as he is, not as he wishes to be perceived when aware of being watched or collected upon.

Pound for pound and unit for unit, there is no platform more capable of discerning, dissuading, deterring, defeating or destroying an opponent's aspirations or forces on *either* a global or local, open ocean or littoral basis than a modern nuclear submarine. With a single unit, and for months at a time, unsupported, it gathers and disseminates situational awareness while holding not only *any* sea-based forces at risk, but also key infrastructure ashore within 1000 miles of the high water mark. As a forward-dispersed and survivable picket line, it is in a position to call in heavier reserve forces when and where needed—the ideal companion concept to the *surge* capabilities of the surface fleet. In fact, the *more* it is desired to trim excess forces or facilities, the *less* that submarines and their present basing and support facilities should be considered as a part of this downsizing. In an analytical sense, real numbers could quite likely support a conclusion that if X dollars more were invested in Submarine Force structure, than 2 or 3X dollars of other *stuff* could safely be retired. General Grant would quickly recognize these ubiquitous units as naval cavalry, and Teddy Roosevelt would probably and proudly label this Submarine Force as "The Great *Black* Fleet".

If this sort of exquisitely credible ubiquitous *armed presence* in the world's *maritime commons* is deemed a desirable thing, as it intuitively seems, than the issue of force sizing becomes a simple mathematical drill—with about 50% of the boats being nominally at sea at any time, and about 50% of those on local operations for training and certifications, than the desired force level would be about 4X the number of desired deployers—in this case 48-64. The key to proper Submarine Force level planning is *not* Anti-Submarine Warfare (ASW) as *conventional wisdom* generally implies, but rather a universal and secure *armed* global presence, with minimal logistic support, in support of Maritime Domain Awareness and Dominance (sea control and/or sea denial—or

command of the maritime commons as Professor Barry Posen would call it) as required. As Submarine Force Type Commanders are fond of saying, SSNs provide presence with both a product (MDA) and a purpose (MDD).

It would appear that those conducting the last BRAC *got it* as described above, since although Submarine Base New London had been placed on the closure list by *the Navy*, the BRAC Commission removed it. It also appears that Congress has seen the logic, since the construction rate of *Virginia* class SSNs has increased from one a year to two, and a contract recently signed for ten more *Virginias* over a 5-year period.

ENDNOTES

1. Grant, Ulysses S., *Personal Memoirs of Ulysses S. Grant*, New York, Charles L. Webster & Company, 1885–86, Vol. II, Chapter XXI.

2. See Barry Posen, "Command of the Commons", *International Security*, Volume 28, No. 1 (Summer 2003), pp.5-46 in which it is argued that the United States presently commands the space, airspace and maritime "commons", what this means, and issues related to retaining this command. It is implicit in the article being read that the most effective, cost and otherwise, method of maintaining command of the maritime commons involves an effective and appropriately sized U.S. Submarine Force.

3. These were the "core values" identified as crucial to present and future submarine design and procurement by then VADM Bruce DeMars, Deputy Chief of Naval Operations for Submarines, OP-02, during the development of the SSN-21 *Seawolf* program.

4. In this introduction Keegan beautifully describes how, since the earliest of recorded history, both the capital intensity of a merchant ship itself, not to mention its cargo, has made it a target of human greed that transcended the logic of the unwritten code of sailors to protect and care for one another, and thereby made necessary the development of warships to protect a nation's trade.

5. An early sign of imminent Soviet collapse was when their blue water Navy pulled back into the Barents in a defensive stance (homeland defense? Coast Guard-like mission?) for "the Northern Flank" of the Red Army.

AMI HOT NEWS FROM AROUND THE WORLD

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From the January 2014 Issue

POLAND Submarine Tender Process Will Begin in 2014

On 20 December 2013, the Polish Inspectorate of Armaments announced its intention of conducting technical dialogue with industry to prepare for the acquisition of three submarines. The technical dialogue will be conducted in February and March 2014 with the tender being launched in the second half of the year.

Interested entities that are known to have already expressed an interest (of note, list is not all inclusive and additional participants will surely be added through the end of January) in participation include:

- German's ThyssenKrupp Marine Systems (TKMS)
- France's DCNS
- Republic of Korea's Daewoo Marine and Engineering (DSME)
- Naval Shipyard Gdynia
- Polish Defence Holding (former Bumar Group)
- OBR CTM Research Center
- Rolls Royce Poland
- Unitronex Poland (represents ITT Exelis)
- Thales Poland

Following the release of the tender, the Polish Navy (Marynarka Wojenna – MW) will probably require submissions by the end of the year as the sea service intends to have completed construction contract by the second half of 2015. The first unit will commission in 2019 and the second in 2022. The contract will more than likely have an option for a third unit, which is currently scheduled for delivery in 2030.

All three of the submarines will be built in Poland with foreign design and construction assistance from the selected supplier.

Naval Shipyard Gdynia will be the prime contractor with all foreign and domestic yards operating under subcontractor agreements.

The primary designer will be either TKMS with its Type 214/Type 212A (no SSMs), DCNS with its Scorpene or DSME with the Type 209/Type 214. The deciding factors will reside in price (currently estimated at US$2.4 to 2.9B), technology transfer and shipyard modernization agreements as Poland intends to further develop and expand its indigenous shipbuilding capabilities to western standards.

JAPAN – Surface Combatant and Submarine Force Level Increases

In late 2013, the Japanese Government released its latest two defense documents, the *National Defense Program Guideline (NDPG) 2013* and the nation's first *National Security Strategy (NSS)*. NDPG highlighted the need for an increased defense budget and increased force levels in regards to the surface combatants and Submarine Forces.

These force level increases will be supported by an average annual defense budget of US$46.4B from 2014 through 2019, or US$232.4B over the five-year period. Although the budget is beginning to rise again, it is only returning to the budget levels witnessed in the early 2000s before budget and force levels were curtailed in the mid and late 2000s.

NDPG 2013 calls for an increase of surface combatants from 48 to 54 and the Submarine Force from 16 to 22. These new force levels will ensure that one destroyer and one submarine are funded annually for the foreseeable future (2014-2019 and beyond) while at the same time extending the service lives of those units in service in order to attain the higher levels until new construction vessels are delivered.

In regard to the surface combatant force, the Japan Maritime Self Defense Force (JMSDF) is already planning for the addition of two AEGIS destroyers under the Future Guided Missile Destroyer Program (33DDG) that will begin in 2015. One will be funded in 2015 and the second in 2016.

The four Akizuki class destroyers will be completed in 2014 and followed by the New Generation Destroyer (DD25) that may begin by 2017. DD25 calls for up to four new units. In order for the surface combatant force to grow from 48 to 54 units over the next decade, the JMSDF will probably build additional DD25 hulls or an entirely new class. The JMSDF began planning for a new destroyer, DD27 in 2011, however, was cancelled to due budget shortfalls. With the now increasing defense budget, this program could be reinstituted although it would require additional funding beyond one destroyer per year.

These new combatants in conjunction with a life extension program for the two units of the Hatakaze (mid-80s vintage) class and the majority of the nine units of the Hatsuyuki class (mid to late 80s vintage) would be required to meet the initial increase to 54 units, then followed by new construction deliveries.

In regard to the increased Submarine Force, NDPG 2013 indicated that the force structure would grow from 16 to 22 units through new construction and service life extension of existing units. Currently the JMSDF operates three classes of submarines, four Harushio, eleven Oyashio and five Soryu with three additional Soryus commissioning through 2017. With the completion of the Soryu in 2017, the JMSDF will be able to decommission its first Harushio (late 90s vintage) while maintaining the new 22 unit force level.

However, immediately following the completion of the original eight units of the Soryu class, the sea service will have to immediately begin procuring additional units of the Soryu class or a newly designed AIP submarine in order to maintain the 22 unit level. When those new units begin entering service the JMSDF will then be able to decommission the remaining units of the Harushio class.

ASIA – VIETNAM: Kilo (636) Class Conventionally Powered Attack Submarine (SS): In late December 2013, the Vietnamese People's Navy (VPN) received its first Kilo class submarine, HA NOI (HQ-182). The submarine, built at Russia's Admiralty

Shipyard, arrived at Cam Ranh Bay port facility in late December. Five additional units of the class will be delivered to the VPN through 2017.

DID YOU KNOW?

RUSSIA: On 28 November 2013, the Russian Navy's (VMFR) first Varshavyanka class (Improved Kilo Project 636.3) conventionally powered attack submarine (SS), RFS NOVOROSSIYSK, was launched at Admiralty Shipyard in St. Petersburg, Russia.

RUSSIA: On 17 December 2013, the Russian Navy's (VMFR) second Borey class (Project 955) nuclear powered ballistic missile submarine (SSBN), RFS ALEXANDER NEVSKY (k 550) was commissioned.

UNITED STATES: In late December 2013, General Dynamics – Electric Boat (GD-EB) was awarded a US$121.8M contract (under existing contract N00024-12-C-2115) for long lead time materials for the second Fiscal Year (FY) 2014 and two FY 2015 Virginia class nuclear powered attack submarines (SSNs).

MODERNIZATION PROGRAMS

INDIA – Surface Combatants and Submarines: In mid-February 2014, the Indian Navy (IN) selected and awarded a contract to Atlas Elektronik of Germany for the ACTAS ultra low-frequency active/passive towed array for several new construction and modernization programs. The selection follows a decade of waiting for the indigenous NPOL towed array, which continues to face delays.

The ship classes that will receive the ACTAS include the following:

- Three Shivalik (Project 17) class frigates
- Six Talwar (Project 1135.6) class frigates.
- Four Abhay (Project 1241E) class FAC.

It appears that the NPOL (Mihir) sonar will not enter service with the IN. The upgrade to the ACTAS will probably run through

2018 as there are also several classes of new construction combatants that will also get the sonar.

Also in February, the sea service selected the Sagem SIGMA 40 ring laser gyros for the navy's four existing Shishumar (Type 209/1500) class submarines and eight remaining Sindhughosh (Kilo Project 877EM) class submarines. The gyros will be installed by the end of 2014.

The eight Sindhughosh class will also receive the L-3 KEO Model 86 non-hull penetrating masts that are already found on the four units of the Shishumar class. The new periscopes could be installed by 2016 as the submarines become available.

The four Shishumar class will also receive an anti-ship missile (ASM) capability. The IN is in the process of selecting either the Russian Novator 3M-54E Klub-S ASM or the Boeing Harpoon. The missile decision should be by the end of 2014.

From the February 2014 Issue

POLAND – Eight Offers Submitted for Submarine Program

On 20 December 2013, the Polish Inspectorate of Armaments announced its intention of conducting technical dialogue with industry to prepare for the acquisition of three submarines. As of January 2014, eight bidders have responded to participate in the technical dialogue that will be conducted through the end of March 2014. A full tender is scheduled to be launched in the second half of the year.

The eight interested parties to date include the following companies:

Designers/Builders:

- ThyssenKrupp Marine Systems (TKMS)
- Consortium of Sweden's procurement agency Forsvarets Materielverk and Kockums
- DCNS
- Navantia

System Suppliers/Integrators:

- Thales

- Kenbit
- Saab
- Kongsberg Defence & Aerospace

The Inspectorate of Armaments has also announced that it still has the right to invite other entities which did not reply to the original call to participate in the dialogue. We expect that ATLAS Elektronik and Lockheed Martin MST will both be interested in providing the underwater fire control systems for this potential procurement. Assuming that the technical dialogue will last through the end of March, AMI estimates other interested parties will be able to respond by that time unless dialogue period is extended past March, which may extend the period to submit as well.

Assuming that the program remains on schedule, the tender release could occur as early as mid-year with the Polish Navy (Marynarka Wojenna – MW) requiring submissions by the end of the year as the sea service intends to have a completed construction contract by the second half of 2015. The first unit is currently scheduled to commission in 2019 and the second in 2022. The contract will more than likely have an option for a third unit, which is scheduled for delivery in 2030.

All three of the submarines would be built in Poland with foreign design and construction assistance from the selected supplier. Naval Shipyard Gdynia will be the prime contractor with all foreign and domestic yards operating under subcontractor agreements.

The primary designer will be either TKMS with its Type 214/Type 212A (no SSMs), DCNS with its Scorpene, Navantia with a variant of the S80 and Kockums with the new A26 design. The deciding factors will reside in price (currently estimated at US$2.4 to 2.9B), technology transfer and shipyard modernization agreements as Poland intends to further develop and expand its indigenous shipbuilding capabilities to western standards.

Regarding the competition for the submarine systems suppliers and integration, AMI expects Kongsberg has an advantage in that the current Polish Navy Kobben class boats operate the Kongsberg MSI-90U combat system.

PAKISTAN – Submarine Delta by the End of 2014?

In early February 2014, AMI received information that Pakistan was close to concluding a deal with the People's Republic of China (PRC) for the acquisition of up to six Yuan (or S20 international design) class diesel electric submarines. Source indicates that the transaction could be completed by the end of 2014 and that final financial negotiations were underway.

This corroborates information received from Pakistani naval sources in 2013 that the construction phase of the program would begin in 2014. Assuming that the deal is concluded, four of the Air Independent Propulsion (AIP) equipped units of the Yuan (Type 041) class will be built at China State Shipbuilding Industrial Corporation's (CSIC) Wuhan yard and the remaining two in Pakistan's Karachi Shipbuilding and Engineering Works (KSEW). AMI estimates that each unit will cost around US$350M, significantly less than if procured from a western yard.

The Chinese-built submarines will begin construction by late 2014 or early 2015 and the first Pakistani-built unit by the end of 2015. All six units could be in service by 2023. The submarines will be entirely Chinese including the main power plant (including AIP), sensors and weapons although some of the Chinese systems are based on western derivatives.

With the Pakistani decision to procure a Chinese submarine, the sea service continues its transition from a western designed naval force to that of Chinese origin. In the interim, Pakistan has apparently been able to operate systems from different suppliers as evidenced by their frigate and fast attack craft (FAC) forces and in the not too distant future, the Submarine Force.

AMI believes that Pakistan will continue its shift to Chinese suppliers for the majority of its future requirements such as ASW frigates and additional FAC. Turkey may also play a small part in Pakistani procurements as witnessed by recent patrol craft and Fleet Replenishment Oiler (AOR) acquisitions.

Pakistani sources have indicated that lower program costs and far fewer end user restrictions (equipment use, modification etc) have had a major impact on its decision to shift to new suppliers rather than continue with its historical suppliers.

RUSSIA – Additional Borey Class Ballistic Missile Submarines (SSBN) Planned

In late 2013, AMI received information that the Russian Navy (VMFR) will continue to build Borey class (Project 955/955A) nuclear-powered ballistic missile submarines (SSBN) through 2020, essentially increasing the planned force from six total units to eight prior to moving on to its Fifth Generation (5G) SSBN. AMI estimates that the first 5G SSBN will begin construction in 2030 with the last Borey commissioning around 2026.

The fifth and sixth units were planned to begin in 2014 although AMI believes that unit five will start in 2014 and unit six in 2016. With a two-year interval between starts, unit seven will probably start in 2018 and unit eight (final) in 2020.

The last four units of the Borey class will replace the remaining three Delta III (Project 667BDR) class SSBNs and the new 5G SSBNs will begin replacing the Delta IV (Project 667BDRM) class beginning around 2036.

MODERNIZATION & SHIP TRANSFER NEWSLETTER

SWEDEN – Gotland (A19) Class Submarines: In late 2013, OSI Maritime Systems was awarded a contract for the Tactical Dived Navigation System (TDNS) for the Royal Swedish Navy's (RSwN) three Gotland class submarines. The systems will be delivered to ThyssenKrupp Marine Systems (TKMS), which is lead contractor in the Gotland class mid-life upgrade program.

The mid-life upgrades are being conducted at Kockums, Malmo yard in Sweden.

POLAND – Kilo (877EM) Class Submarine: In late October 2013, the MW signed an agreement with Gdynia Naval Shipyard for the dry-docking and overhaul of the Kilo class submarine ORZEL (291). Scheduled work includes:

- Hull, Mechanical and Electrical (H,M&E) work.
- Replacement of batteries.

- Software upgrades to the combat management system (CMS) and sensors.
- Upgrades to weapon and communications systems.

The overhaul will last through November 2017.

USED SHIP TRANSFERS/RECEIPTS/ DECOMMISSIONINGS

INDONESIA – Kilo Class (Type 877/636) Diesel Electric Submarines: On 05 October 2013, AMI received information the Indonesian Navy (TNI-AL) was offered up to 10 Kilo class submarines from Russia as a grant. The submarines, built from the 1990s through 2000, are currently being decommissioned from the Russian Navy (VMFR). The submarines are of the 877 and 636 series. Russia is currently building the latest model, the 636.3, for the VMFR.

In January 2014, an Indonesian delegation visited Russia to discuss the offer. Talks were to include new construction Kilos (probably the Kilo 636.3 variant) and used units of the 877 and 636 variants. Although the Indonesians are willing to entertain the idea of procuring new construction Kilos, AMI believes that if any Kilos are procured they will more than likely be used submarines in order to meet the 2024 force level requirements.

Indonesia is currently in the midst of the procuring three new construction Type 209s submarines from South Korea. Two of the units will be built in South Korea and the third in Indonesia. Indigenous naval shipbuilding programs are high priority in Indonesia as it attempts to modernize and expand its shipbuilding infrastructure which now includes the construction of large amphibious ships, frigates and submarines.

AMI does not believe that the TNI-AL would invest the funding in a new construction program in Russia for hulls that will last from 30 to 35 years. It makes more sense and is a better investment to procure used Kilos (4-6) while investing future procurement funds in building additional Type 209s (past the first unit) in Indonesia.

The grant or procurement of four to six used Kilos (with a modernization package included) from Russia would probably

cost less than half that of new submarines. Used Kilos would give the TNI-AL up to fifteen years of service while waiting for new construction units to be launched from PAL Shipbuilding.

The used Kilos would also enable the TNI-AL to recruit and train large numbers of new personnel in basic submarine skills to operate the much larger Submarine Force prior to the arrival of indigenous hulls (probably based on the Type 209). An additional benefit would be that the Indonesian sea service would gain knowledge in submarines that are being used by possible adversaries.

AMI believes the offer of the used Kilos by Russia is obviously a marketing strategy in order to break into the Indonesian naval market, which it has failed to do so for the past decade. An acceptance of used hulls from Russia would probably end there as Indonesia needs future procurement funding to move forward with construction of new hulls in Indonesia. Any order of new Russian hulls would probably delay any further indigenous submarine (past the one Type 209) construction by at least two decades and AMI firmly believes that Indonesia is not willing to wait that long as indigenous construction is a top priority.

From the March 2014 Issue

UNITED ARAB EMIRATES

Submarine Program Update—As of early March 2014, AMI continues to receive information concerning the submarine program for the United Arab Emirates Navy (UAEN). Source indicates that the requirements for the UAE Submarine Force are for hulls ranging from 300 to 1,000 tons. Fincantieri is also said to be involved in the early discussions.

Fincantieri (with Russia) is one of the co-designers of the S-1000 design. AMI believes that 1,000 tons is probably the upper limit for the UAEN as it will have to operate in the restricted waters in the Arabian Gulf if it intends to oppose the Iranians new fleet of small submarines. Source does acknowledge that this program is still in its infancy but is the first time that Fincantieri

has been directly mentioned for the program and that the size range is beginning to solidify.

AMI believes that Finacantieri's cooperation for the submarine program is a logical extension of Italian support to the UAE as Italy has made major inroads into the UAE naval market over the past several years with the Commandante (Abu Dhabi) class corvettes and the Falaj 2 class fast attack craft (FAC).

Fincantieri has also joined fores with the UAE in a Joint Venture (JV) with Al Fattan Shipyard (known as Etihad Shipyard) and Italy's Selex with Abu Dhabi Ship Building (ADSB) (a JV known as Abu Dhabi Systems Integration).

AMI still believes that the UAEN submarine program will probably not actually start until the end of the decade, possibly 2020, following the start of the frigate/corvette program.

UNITED STATES—LCS Program Truncated, New Frigate in the Offing

On 24 February 2014, the US Secretary of Defense (SECDEF) issued a memorandum (memo) updating the status of the US Navy's (USN) Littoral Combat Ship (LCS) Program. The memo was directed to the Secretary of the Navy (SECNAV) and the Chief of Naval Operations (CNO).

SECDEF directed that there would be no contract negotiation for the LCS program in its current form past 32 units. This direction is based on concern that, if the program is completed at its planned 52 units, the two classes of LCSs (Independence and Freedom) would represent one sixth of the projected 300-ship Navy. The memo also directs that the USN provide regular updates on performance of LCS as well as alternative proposals for LCS to be used during PB2016 deliberations.

The alternative proposals are for capable, yet lethal small surface combatants that are consistent with the size of a frigate. The memo states all options including new designs, existing designs or modified LCS designs would be considered. AMI believes that since this information is required by PB2016, the

USN could in fact truncate the current LCS program at the 24 units that are currently under contract by Lockheed Martin and Austal. This would allow for an 8-unit window to keep the shipyards employed with current LCS construction during any switchover to a new program if that is the decision.

There is no doubt that the three Lockheed Martin LCS variants are on the table as well as the Huntington Ingalls Industries Patrol Frigate. General Dynamics also has several designs that could be included for one of the platforms.

AMI believes that probable truncaction of LCS is in order to better balance the future fleet. While the sea service will need ships to fight in the littorals, 52 hulls may be too many. With regards to open ocean warfare, the USN has yet to replace the Oliver Hazard Perry (OHP) class frigates that are being decommissioned. Essentially, the USN will be left without a frigate that has historically provided critical anti-submarine warfare (ASW) and anti-surface warfare (ASuW) protection for large carrier and amphibious strike groups.

By reducing the LCS Program in its current form and then building new frigates (which could also be based on LCS, the HHI Patrol Frigate or a General Dynamics design), the USN will be able to better balance its open ocean fleet while adding the capability to fight in the littorals. The fact is the USN will probably never grow beyond the projected 300 ships, so there must be an adjustment for better balance and it must occur sooner rather than later as funding levels will probably not improve much in the short or long terms.

REGIONAL UPDATES

INDONESIA SHIPYARD: On 18 February 2014, AMI sources indicated that PAL Shipbuilding in Indonesia would receive up to US$250M for yard improvements/modifications in order to begin construction of Type 209 submarines. The yard would receive US$180M in 2014 and the remaining US$70M in 2015. The majority of the funding would be for the construction of the submarine building facility at PAL.

SSBN ARIHANT: On 09 February 2014, the Indian Defence Research and development Office (DRDO) announced that the INS ARIHANT would complete all sea and weapons trials by the end of 2014. If all trials are successful, INS ARIHANT will commission into the Indian Navy (IN) in 2015.

DID YOU KNOW?

BRAZIL: On 14 February 2014, Brazil's Ministry of Defense (MoD) announced that the Brazilian Navy's (MdB) first nuclear-powered attack submarine (SSN) would be commissioned in 2023.

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(wife of the late RADM P. Hall, USN, Ret.)

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FEATURES

THE SUBMARINE WATCH OFFICER

U.S. NAVAL INSTITUTE, ANNAPOLIS MD
PROCEEDINGS: VOL 46. NO. 6 JUNE 1920 pp. 255-359

By Lieutenant L. J. Stecher, U.S. Navy

Editors Note: CAPT John Paulson USN (Ret.) submitted the following: While researching primary documents in the Navy Library regarding sub vs sub actions in World War I, a noteworthy article titled The Submarine Watch Officer immediately diverted my attention. The article details the foundations of many submarine practices, and the importance of documenting lessons learned from new technology, procedures, and practices. Many of the article's lessons learned are now elements of well known directives. It also included reference to the submarine action I was researching.

The 1,894 word article is the original collection of submarine wisdom from actions in "the war" written by Lieutenant L. J. Stecher, USN and printed in U.S. Naval Institute Proceedings, Volume 46, No. 6 of June, 1920.

It cannot be repeated too often that the object of military and naval training in peace time is to prepare for war. War is our harvest time, and whether we reap richly or poorly depends largely on the intensity and quality of the training undergone.

But no matter how thoroughly and conscientiously we may have trained for, and studied war, in peace time, its final arrival will always reveal many a new lesson. Every new battle teaches us something, and the benefits from this should be twofold. The mistakes we made should teach us how to avoid them in the future, and through publication should serve to guide others.

But there are always some weapons in the art of war which are a departure from anything used before. The men in charge of these are then pioneers in their line, and have nothing in the way of the experiences of others to guide them. During the late war the submarine, perhaps, fell into this category more than any other innovation. And on board the submarine, the latest product is the submarine watch officer.

In pre-war days, submarines were taken less seriously, and they seldom went to sea for a period longer than two or three days. Consequently, there was little necessity for any extra commissioned personnel to be used as watch officers. At the outbreak of hostilities, however, this was all changed, and many new, comparatively inexperienced, officers had to be ordered to this duty. Similar conditions will always prevail, and it is largely for the benefit of these inexperienced newcomers, that the following few remarks are set down.

The first thing that an officer must do when reporting to a ship for duty, regardless of the type of vessel, is to get acquainted both with the ship, and the officers and men. This is particularly true on board a submarine. Every officer must understand not only his own particular duty, but he must always be prepared to perform the duties of every other man on board. Unless he can do this, he is not a qualified submarine man. As an illustration of the importance of understanding what one is about, the writer will cite an incident that was very close to becoming fatal.

The U.S.S. A-5 was making a submerged run at various depths. The vessels of this class have only one main hatch, and the hatch is secured by means of a spindle clamp, which draws the hatch snugly against a large rubber gasket. The submarine changed depth from a periscope run to about 70 feet. At this submergence the great water pressure against the hatch compressed it tightly on the rubber gasket, and the spindle clamp became loose. An inexperienced reserve ensign in the boat saw the loose spindle, and, unobserved by anyone, tightened it. Then the A-5 started on her rise to the surface, the pressure on the hatch becoming less, the gasket exerted a large pressure on the spindle and stripped the thread. Water immediately rushed into the boat, and it was only by

the greatest of good fortune that the vessel came safely to the surface. This serious situation was caused entirely by the lack of complete understanding of a submarine by this officer.

Among the first things any officer should master is the construction of the ship. It is well to obtain a complete set of blue prints, and to study these carefully. In this way excellent information can be obtained regarding the construction of the hull, the arrangement of tanks, the lay of the pipes, etc.

When you have carefully studied the blue prints, you should go into the boat and trace out as many of the pipe lines as you can. Be sure you are able to pump, flood, or flow any tank into any other tank, or overboard. Do not hesitate to ask questions about anything of which you are in doubt. The longer you are aboard, the more you will be expected to know, and the more embarrassing it will be to have some one discover that there are some things about your boat that you do not know.

Having mastered the construction of a submarine, it is well that you then study its propelling machinery. Every one should know in a general way the limitation of a battery and something about its care and preservation. In the Battery Instruction Book can be found some very useful information in regard to this. And as to the motors and engines, every one on board should be capable of operating both.

Then, having mastered all the foregoing, you are approaching the stage where you are becoming of some use to your commanding officer. He will assign to you some special departments, and about these you should know more than any one else in the world. A personal notebook containing memoranda of repairs necessary, etc. will be of great value.

Equally as important as a complete knowledge of your ship, is a thorough understanding of every man of the crew. An officer should know them all by name and take a personal interest in their comfort. Make them feel that you have their welfare at heart. You cannot handle every man in the same way, and unless you understand how to deal with each individual, you will have trouble.

With the foregoing knowledge well under way, you will be prepared to take a watch at sea. In the war zone, standing a watch on a submarine is a very responsible duty. This is especially true when there are hostile submarines likely to be submerged in your vicinity. As an example the following is related. The U.S.S. AL-4 was cruising on her patrol *billet* charging batteries, when on her starboard bow, at a distance of about 1000 yards, the officer of the watch sighted a periscope. He immediately made the *crash* dive signal and the submarine dived. Her hull had hardly settled below the water, when a torpedo from the hostile craft passed directly over her. Here the good eyesight, quick judgment, and proper execution of the correct procedure by the officer of the watch alone saved his vessel.

While on watch, you have under you the men on duty at the various stations. You should check the helmsman's steering and require him to make a half hourly comparison of the steering repeater with the standard compass. The lookout must be alert and, above all, know what he is on the lookout for, and what this will look like. The men in the engine room you cannot personally supervise, but you should find out who they are, and who is in charge. Ascertain whether the radioman is on watch as required, and that he understands his duty.

Next there is the vessel itself. The submarine must always be in readiness for a *crash* dive. This will require a frequent compensation for oil and fuel used. You should require regular reports from the engine room, stating that this has been done. Remember which tanks have water, and how much, and which must be flooded in case of a crash dive. The torpedoes, being the submarine's most effective weapons, should be kept in a condition most consistent with their preservation and quick use. Regular reports from the torpedo room should be made, to show that the orders of the commanding officer regarding torpedoes are being carried out.

In attending to these important duties, the watch officer must not neglect to keep in mind the correct set of recognition signals. In the late war, perhaps the greatest single danger to a submarine was the difficulty of quick and correct exchange of recognition

signals between friendly ships. Many examples could be given, but the writer will relate but one that is from his own personal experience. It took place one stormy, dark night, when the visibility was very poor. While on watch on the U.S.S AL-1, cruising on the surface to her patrol station off the coast of Ireland, he sighted the outline of a submarine. To all appearances it was an enemy vessel. Immediately orders were given to get torpedoes ready and an attack was begun with full speed on the engines. Just before firing, however, a recognition signal was made, on the possibility that it might be a friendly boat. An immediate and correct reply was made by the challenged vessel and the attack was broken off. Had she delayed even so long as a minute, that minute might have caused her destruction.

A very important thing to observe is the constant readiness for a *crash* dive. Loose gear must never be kept on the bridge or on one's person. The U.S.S. AL-9 was cruising on the surface in a very heavy fog, when the fog suddenly lifted, and a large German submarine raider was revealed not 500 yards away. The signal to dive was given and the vessel submerged. In going below, however, the officer on watch got his binocular strap caught under the conning tower hatch. As the hatch went under, a stream of water rushed in, and it was necessary to come to the surface again in order to clear the strap. During all this time, the German raider was dropping shells all around, and it was only by the very best of luck, and by the poor marksmanship of the Germans, that no shell found its way into the AL-9 and sent her to the bottom.

Then, when submerged, it is always well for the watch officer personally to observe any order to flood or blow being carried out. The AL-4, in the war zone, was saved only by the bottom of the sea from never seeing daylight again, simply because when the order to flood adjusting tank was given, the man, by mistake, took hold of the auxiliary tank kingston lever instead. Had the water been deeper, the AL-4 would have been lost. As it was, it took all the resource of the commanding officer and an hour's hard work to extricate her from the mud and bring her to safety.

Every vessel has her own peculiarities in the submerged state. These you must study and understand, always endeavoring to

maintain the ship at the proper trim. When running a listening patrol, frequent stops are made, during which the operator listens in. During these times care must be taken that the vessel does not acquire too much upward or downward momentum. As the depth changes the rise or fall increases and is much harder to check.

In conclusion, the writer wishes to point out to the new officers the great importance of absolute self-reliance. In a submarine the officer on watch is virtually the commanding officer, and on him directly depends the safety of the vessel and the lives of the crew. Emergencies will arise that must be handled immediately. There is no time to notify the commanding officer. There will hardly be time for thought. To prepare most efficiently for such emergencies, picture to yourself as many as you can, and decide what would be the proper procedure. If in doubt, ask your commanding officer. Do all this while off duty. Then when on duty keep always alert.

SUBMARINE COMMUNITY

114th SUBMARINE BIRTHDAY BALL
NAVAL POSTGRADUATE SCHOOL
MONTEREY, CA
26 APRIL 2014

RADM R. P. Breckenridge, USN
Director, Warfare Integration
(OPNAV N9I)

Good evening, and let me start off with a big "Happy Birthday, U.S. Submarine Force!!" 114 years and going strong and from my viewpoint up here—you're looking mighty fine tonight! What a turnout! Very impressive.

Melanie and I are very grateful and deeply honored to celebrate this important Sub Force milestone with you tonight – and I would especially like to add emphasis on *here* with you tonight, *here* at this most spectacular venue.

This *is* special. Take a minute and let it soak in. We have celebrated this event at many awesome settings over the course of our career, but never at one as elegant and luxurious as the Del Monte Hotel ballroom. You can't help but imagine the grand parties that have occurred within these walls over the past century, where the wealthiest of Americans came to vacation- in style… At times I wonder what the railroad barons would think about their prized *resort by the sea* becoming home to a post graduate school and a naval one at that! What would be their reaction to a group of scrappy, undersea warriors invading their grand ballroom? Would they sound the alarm? Call in the authorities to toss out these vagabonds? Well, deep down in their hearts—I think they would be pleased. These great Americans were very patriotic and well understood the value of a strong military. Among all the warfighters who sacrifice much for our country, they would be downright proud that it was the Submarine Force that commandeered their prized ballroom for an occasion like this tonight.

They among all Americans, know that what you do matters so very much for our national security and global prosperity. Like the rail lines, they can appreciate the vital importance of keeping commerce safe and flowing on the ocean routes, to and from major ports around the world.

I think they would deeply appreciate the way you wield your power from the deep – as an instrument that deters aggression and holds in-check the bad behavior of our adversaries.

So close your eyes and picture them looking down on us tonight—lifting their glasses in a toast. "To the intrepid prowlers of the deep—we salute you! Enjoy our ballroom! Just make sure you don't get too *out of control"*—knowing we're submariners after all.

This is a special venue for Melanie and me—our absolute favorite shore tour by a dramatic margin. Our 29-year old navy lieutenant son was a toddler during our time here—and he still speaks of Dennis the Menace Park and the "quarium." Our 26-year old daughter takes special pride in being born a Californian—a Carmelite, no less!

Today we drove around to visit the old haunts 25 years later. La Mesa, Fishermans Wharf with the sea lions and the playful sea otters, and then Cannery Row and the eye-popping beauty of the Pacific Grove coastline. Although we were short on time, we couldn't pull away as we were drawn further around the bend down Sunset Beach. As though a powerful and compelling force had gripped us and would not let us go; captivating our longings as we soaked in the most spectacular vista's anywhere in the world—onto Pebble Beach and 17 Mile Drive.

You may have grown numb to it—seeing it as often as you do—but for us, we nearly wept in the face of such incredible beauty—pure rejuvenation. This place has that kind of effect on your soul.

And we're not alone. This same allure has enchanted other visitors within its spell over the decades. There is one distinguished guest in particular I would like to speak of tonight. He stayed at the Del Monte Hotel over 100 years ago. In a display case adjacent to the Trident Room in the basement below us, there

is a photo of a ruddy man on horseback with an accompanying quote below his picture:

> "This is a beautiful hotel with gardens and a long 17-mile drive beside the beach, the rocks and among the pines and cypresses. I went on horseback. My horse was a little beauty, spirited, swift, sure-footed and enduring. We had some splendid gallops." Can you guess who I am talking of? These words came from one of our great presidents, Teddy Roosevelt. He visited in May, 111 years ago next month.

Well, tonight I want to tell you a story about Teddy Roosevelt that occurred less than two years after his exhilarating horseback ride from the grounds of the Del Monte Hotel. The story involves the President, our young (5-year old) Sub Force, and a 10 dollar bill. This story early in our history went on to define our identity, our DNA if you will. The thing that makes submariners stand apart from the rest—the powerful, enduring trademark quality that best characterizes this special group of warfighters who ply the oceans from the depths of the sea.

The year was 1905, our Submarine Force had just passed its fifth birthday. We were the navy's toddlers, the new kids who stumbled and struggled and fought to find our place. The promise of USS HOLLAND, delivered to the Navy just a few short years before, had materialized as the mighty A-Class of submarines: PLUNGER, ADDER, GRAMPUS, PIKE, SHARK, and PORPOISE. Oh, and MOCCASIN. Now, SHARK and ADDER sound formidable. PORPOISE and PIKE are appropriately fishy. And GRAMPUS is an old-school name for an orca or killer whale. I really don't want to talk about MOCCASIN. But the lead ship of the class, PLUNGER? Well back then, plunger had two meanings, and both were apt. A plunger was another word for a diver…but it is also synonymous with a gambler who takes extraordinary risks. And these were times filled with extraordinary risk for our Sub Force.

These marvels of modern technology, with their top end speed of 8 knots; and 60-foot test depth, were held in such awe and fear

and high regard by their battleship brothers… that submarine duty was classified as… shore duty, and submarine sailors received 25%... less pay… than the men on destroyers, cruisers, and other surface ships. John Holland, the inventor and designer of the A-Class, is quoted as saying, somewhat bitterly, "the Navy doesn't like submarines because there is no deck to strut upon."

But little more about PLUNGER. She was propelled by a 4-cylinder gasoline engine, a very close relative to the exact model that was pushing Henry Ford's model-t Tin Lizzies on American streets. Her atmosphere monitoring system was a cage of mice kept near the engine when it was running. If the mice collapsed, it was time to think about heading topside. Her periscope was anchored by four guy wires fixed in one position… yes, it could not rotate. For targeting purposes, the ship would *porpoise* to the surface, where the conning tower could look around through deadlight windows to spot an enemy ship. Navigation was conducted via a magnetic compass… attached topside and viewed from below through a mirror. Pretty ingenious and yet pretty primitive and shall we say, outright scary!

These pioneers of submarining were the bravest of men, given the history of submarines to that point. Instead of an outright death sentence, assignment to a submarine had just enough of the tantalizing possibility of actually returning from a dive to attract an odd collection of mariners—like adventure-seeking outcasts from the traditional straight lines and sharp corners of the great white fleet. PLUNGER's commanding officer, Lieutenant Charles Nelson, was no exception. LT Nelson was in command of PORPOISE a year before, and had lost depth control and sunk to the bottom of Narragansett Bay, in waters *twice* the ship's rated depth. The ship was saved through extraordinary and heroic action, making it to the surface with a mere 10 minutes of good air remaining.

So there must have been some misgivings at fleet forces a year later, when the impetuous LT Nelson was picked to demonstrate PLUNGER's capability to none other than President Theodore Roosevelt, he himself not known as a model of self-restraint or timidity. The demonstration was set in Long Island Sound for

August 26, 1905. The President would observe from a surface ship while the submarine was put through its paces.

There would have been *far more* trepidation had Navy leadership known what would happen on August 25th. Gale-force rains lashed Oyster Bay, where PLUNGER was tied up alongside her support ship APACHE, while Roosevelt rested comfortably ashore, waiting for the next day's events. And all would be well if we could just leave the story here, but that rarely happens when submarine LT's are the central characters in a story. For LT Nelson had other ideas on this rainy night—taking matters into his own hands. I could almost hear him chanting under his breath "Fortune favors the bold; fortune favors the bold" as he hiked up Sagamore Hill in the torrential downpour. Well he located the President, and asked him if he would be interested in a private tour of the ship. And it's easy to imagine the enthusiastic President and the earnest young LT, scampering through the driving rain and clambering down through the hatch.

And it may have ended there if this was one of your run-of-the-mill VIP tour kind of stories… but it hardly ever does, does it? PLUNGER split off from APACHE into the teeth of the gale, with a LT of questionable judgment, a President of apparently superhuman courage, and a crew that included a cage of rodents.

The trip is well documented, and afterwards, two things came out of it. Roosevelt publicly proclaimed, "never in my life have I had such a diverting day." Horseback riding on pebble beach was a "splendid day." Underway with LT Nelson in a fierce storm—a "diverting day." To make his impressions unambiguously clear to current and future Naval leaders, the President also set the following declaration: "submariners have to be trained to the highest possible point, as well as, to show iron nerve in order to be of any use." And then Roosevelt immediately established submarine pay at the staggering sum of… ten dollars per month.

Roosevelt's Presidency is enshrined in textbooks. LT Nelson became Admiral Nelson. PLUNGER was loaded onto the top of a derelict surface ship and sold as *deck cargo scrap*. I am not sure what happened to the mice. But I do know this: that $10 investment stands as one of the greatest bargains of all time!

For what Roosevelt purchased in 1905 for a sawbuck a month has endured through time to this very day and is none other than the service, dedication, and enduring loyalty of the people who make up the Submarine Force.

It is pure, inexplicable magic, this bond between people and machines, in distant places and the harshest environments, far from home, far from family, far from support with the constant threat of the danger outside finding its way inside. It's the best kind of magic, and it has happened over and over, it comes through when we need it most, and continues today as it was for the past 114 years.

And yet, ten dollars a month cannot explain the remarkable tenacity and fighting spirit of our long-ago brothers. A key part of our gathering tonight is to pause in remembrance of those who paid the ultimate price in defense of our country. These pioneering days of Submarine Force history were especially risky as we learned the harsh and unnatural business of operating warships submerged at sea. SKATE sank with all hands in 1915. PIKE sank at the dock in Manila Bay in 1917. SHARK exploded and burned in 1918, killing 7. CARP was rammed and sunk with all hands off Point Loma in 1919. It is tempting to believe that dedication like that has something to do with the importance of our mission, the mastery of our environment, the quality of our training, the marvel of our technology. And it does, a little. And so does ten bucks a month. But none of those existed in our early days, when we struggled to find our place and our meaning, when the limitations of our machines frequently let us down and occasionally cost us our lives, and when we did not have the rich legacy of success that came later.

Before we had been heated red-hot in the crucible of WWII, forged in thirty years of Cold War skirmishes, and quenched in post-9/11 combat actions. Before all of that, something happened and something stuck. But what?

When Roosevelt squeezed down the hatch of PLUNGER and shed his damp oilskin and peered through those little round spectacles, the only thing he saw was…us. And it was enough. Enough to tell him that the challenges would be overcome, the

tragedies would be borne, the lessons would be learned, and the promise would be delivered. TR did not see that in gage faces or dark bilges or out a periscope. He saw it in the eyes of those long-ago crew members, with their hats tipped back, and their uniforms filthy with grease. It was only a glimmer, but it was enough. And Teddy anted up with one of the greatest long-shot bets of all time…for ten bucks.

It was enough, that promise, to draw our greatest warriors. Gene Fluckey, Red Ramage, Howard Gilmore, and dead-eye Dick O'Kane. They saw the same promise in the eyes of the crews of BARB, PARCHE, GROWLER, and TANG. To a man, each of them would proudly state their finest moment, their hour of glory, their long years of training and sacrifice that culminated in extraordinary heroism under the enemy's fiercest fire… was built on the indomitable spirits of the *sailors* on their ships.

It was enough, that glimmer, to surround our fighters with the enduring love and support of the families that wait on the shore. For you, no paycheck can be big enough, no medal shiny enough, no citation thorough enough to make up for lost birthdays, long nights, lonely vigils. It has to be the same *something else* that lives in your hearts and keeps you at our sides.

So ladies and gentlemen, tonight we gather to reflect about this uncommon courageous adventurous spirit; the unique identity and heritage we share with those who have gone before us, that we continue to uphold—day-in and day-out while it is our turn to roam the undersea with the best crews in our Navy. As we begin the process of transferring this sober responsibility onto the next generation—so that they in turn operate these incredible submarines to continue to defend America, support our friends and allies, and to restrain the over-reach of our adversaries for yet another prosperous 114 years.

This uncommon ethos, this special bond we share, is at the same time both *splendid* and *diverting.* And like the railroad barons—I salute you tonight and thank you for your honorable and most-meaningful service. Here's to you; you intrepid Prowlers of the Deep! Happy Birthday.

BOOK REVIEWS

THE TRIDENT DECEPTION

Author Rick Campbell
St. Martin's Press, New York 2014

Reviewed by RADM Dave Oliver, USN, Ret.

THE TRIDENT DECEPTION is an exciting book which I actually read in one sitting (not a recommended approach as the plot is so interwoven, twisting, interesting and exciting that I probably shortchanged myself), but I was driven to keep turning the pages to see what was next! The military details will ring authentic, particularly to sea-faring folk, as will the locations. Rick Campbell has obviously walked many seawalls and run his hands along the skin of many weapons!

From the first page when the full moon casts shadows over the trail in Washington's Rock Creek Park, Rick Campbell slowly slides the reader into a world he makes very believable. The reader is quickly drawn into a post-Cold-War reality thriller involving America, Israel, Australia and the Middle East. Within a few pages you are standing shoulder-to-shoulder with senior political and military leaders working to prevent catastrophic world events (at least most appear to be).

At the same time, the reader catches glimpses of shadowy figures also in the governments with their own calculus and ethos, doggedly working toward different ends that would result in the fiery deaths of millions of people.

How many innocents will have to die? What will be the eventual outcome? Rick Campbell will not let you even suspect until the very last page. I thoroughly enjoyed his first novel and look forward to the sequel.

THE TRIDENT DECEPTION

Author Rick Campbell
St. Martin's Press, New York 2014

Reviewed by Captain James A. Ross, USN, Ret.

Captain Ross was the first Commanding Officer of USS NEW YORK CITY (SSN 696) and was later a program manager in the Naval Sea Systems Command. After retirement, he served in the Department of Energy, Defense Information Systems Agency, Missile Defense Agency, and the Department of Homeland Security as a contractor.

THE TRIDENT DECEPTION by Rick Campbell is a true thriller that is set on a global scale. The chapters are generally short allowing several plots to be revealed simultaneously. In almost every instance, each situation changes at the last moment and a new sub-plot is introduced. Although THE TRIDENT DECEPTION is basically a submarine warfare novel, it is also an intriguing espionage tale. The interaction of the civilian government (from the President and his National Security Advisor down) with the military makes for exciting reading.

The initial plot involves Israel, Iran, and the United States. Iran has developed its first nuclear weapon and, in ten days, intends to use it against Israel. Israel wants to destroy Iran's suspected weapon complex but it is too far underground for conventional weaponry and requires a nuclear strike. Israel activates a long-planned secret operation to have the United States destroy the suspected weapon complex. How this operation progresses is fascinating.

USS Kentucky, a Trident ballistic missile submarine carrying a full complement of nuclear warheads, has left on a routine patrol and receives a launch order after which its communications

systems are disabled. What Kentucky's crew doesn't know is that those launch orders haven't actually come from the U.S. government. Kentucky does not acknowledge a launch termination order from the U.S. Navy. The decision is made by the President to locate Kentucky and stop her from proceeding with the weapons launch. With only eight days remaining before Kentucky is within launch range, the Navy is ordered to intercept and neutralize Kentucky. The search for Kentucky is written in technical and operational detail that a submariner will enjoy.

THE HUNT FOR RED OCTOBER was my generation's favorite tale. THE TRIDENT DECEPTION is today's version: fast moving action, full of fictional excitement, high technology thrills and international political intrigue!

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5025D Backlick Road
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