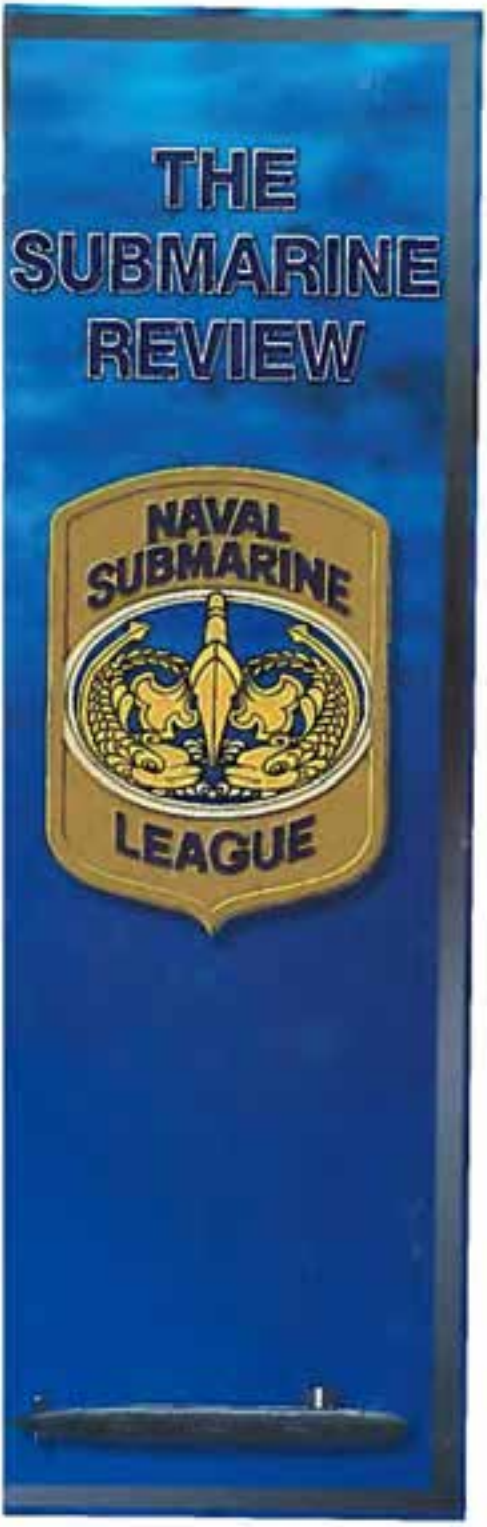

JULY 2005 PAGE

EDITOR'S COMMENTS

A great deal of the conversation throughout the submarine community recently has been about the Base Realignment and Closure (BRAC) committee's consideration of the Pentagon's nomination of Submarine Base New London for closure and wide redistribution of its tenant commands and home-ported submarines. Arguments have been made about the credibility of the quantitative basis of the Navy's decision to do so and many points have been put forward about the military and economic concerns involved. What is increasingly clear, however, is that those points, while most worthy in themselves of serious consideration and refutation of the Navy's proposal, there are issues in that proposal of concern to the submarine community beyond the question of base closure. They are indicative of a non-understanding of what the Submarine Force is all about and is based on a projection of submarine force structure which has not been discussed with the force, vetted by knowledgeable political-military folks nor approved by higher authority responsible for national security and the makeup of the forces which carry out those strategies.

Those broader level concerns are articulated in this issue by two four star officers of great experience with the ways and realities of Washington as well as the issues having to do with the acquisition and employment of forces. That is, they understand logical and grounded arguments and can spot the spurious and overly biased proposals. Admiral Bruce DeMars has provided us with a concise assessment of the impact which appears aimed at the continued effectiveness of the Submarine Force. Admiral Carl Trost, in his remarks at Annual Symposium Banquet, likewise pointed out the implications of breaking up the Submarine Force's *Center of Excellence.* In addition, we are presenting Vice Admiral Chuck Munns' testimony to the Projection sub-committee of the House Armed Services Committee in which he answered the Committee's question about the needed force level of submarines with a number well above that which the Navy put forward as justification for closure of Submarine Base New London.

Not to be overlooked in the overall discussion about Submarine Base New London is the question about what happens to each of the

tenant commands resident there and serving the interests of the Submarine Force. One such is the Naval Submarine Medical Research Laboratory and the Commanding Officer of the Lab, Captain Daniel, has given us an interesting overview of the work being done there.

We also have here a rather broad spread of other interest pieces to complement the BRAC/Force Level concerns. These range from John Merrill's narration of the little known action by the Japanese Navy in the Mediterranean during World War I (the 1914 to 1918 war) to Professor Richard Thompson's proposal for interception of earth-bound extraterrestrial objects by submarine launched ballistic missiles. On a different scene, but in the same vein of submariner capability, is CDR Jabb's piece, Bubblehead in Baghdad, about his experiences there as a reserve working with the coalition force effort. And don't miss CDR Warner's innovative look at transformation in a *Back to the Future* mode.

Again weighing in from a very different perspective is retired Russian Captain George Sviatov with an illuminating article about submarine effectiveness and efficiency of design as measured in firepower per ton of displacement. It seems the SEAWOLF class design has some inherent advantages which might be looked at once again. Two other experienced submarine officers, also both retired and very successful in second careers, look back on their earlier days and each offer a *Lesson Learned* with value that stands the test of time very well. Dave Hinkle and Bill Clautice are to be thanked for their valuable words.

Let me take the opportunity here to offer my public thanks also to the League's Editorial Review Committee for all their work in going over each copy of this magazine before it ever gets to the printer. Please take a look at the organizational page to see who those seven officers are and when you meet with any, please say "Thanks for all you do." Enjoy your reading.

Jim Hay
Editor

FROM THE PRESIDENT

The 2005 Annual Symposium was a great success! The Symposium agenda featured a discussion of current and planned submarine search, escape, rescue and salvage capabilities with the principals responsible for this function providing the details. Mr. John Welch provided the keynote speech that is featured in this quarter's Review. Admiral Carlisle A. H. Trost, USN (Retired) was honored as the 2005 Distinguished Submariner and was the banquet speaker. He presented an outstanding summary of issues important to submariners. His remarks are in the Review. The Submarine Force leadership supported this event with their presence, participation and promotion of the League. You can read about a number of issues important to the Submarine Force in this issue. You can help the Submarine Force with the build rate issue by making your views known to your elected representatives.

The Fleet Award winners made us all proud. All were present or represented by a family member. Awards were presented by Vice Admiral Munns, Rear Admiral Cassias, and yours truly. The Awards Luncheon speaker, Congressman Roscoe Bartlett (MD-6th), provided an informative report on "Peak Oil", noting the impact of the reduced supply on our pocket books and then eloquently tied that thought to the acquisition of nuclear powered submarines. His subsequent actions in support of the Submarine Base, New London with the Base Realignment and Closure Commission have been a real encouragement.

At the Annual Business Meeting I reported the election of RADM Joe Henry, USN (Ret.), CAPT Mike Feeley, USN (Ret.) and Dr. Dave Stanford to the NSL Board of Directors. Admiral DeMars reported that the Board appointed me to the Board for an additional year to continue as the NSL President. Mr. John Casey was appointed to the Board to replace Mr. John Welch following John's resignation. John will continue to be active in NSL activities. The annual audit confirmed the League is maintaining its fiscal status in the black. A summary financial report is in this issue of the Review. A copy of the audit is available from the office. SAIC has completed our database. It was used for the first time for the registrations for the events discussed in this letter. SAIC is working on a new website

that will have a new look and additional features making it more interactive.

VADM George Emery's completed his second year as Chairman of the Submarine Technology Symposium (STS). STS 2005 was a sellout with the largest attendance ever and an outstanding program. Keynote speakers presented throughout the program providing comment from Navy and industry leadership at every session. Excellent papers and posters on a wide variety of topics were presented. The importance of communications at speed and depth was a major session. The Fleet report chaired by COMSUBDEVRON 12 was a highlight with reports of submarine operations as well as technology developments needed to perform current missions. Admiral Ed Giambastiani, USN (U.S. Joint Forces Command and now Vice Chairman, JCS) and General Doug Brown, USA (U. S. Special Operations Command) joined Admiral Kirk Donald, USN (Director Naval Reactors) as keynote speakers.

The Fourth Annual Submarine History Symposium, "*Raiders from the Deep*", was conducted in cooperation with the Naval Historical Center, Navy Historical Foundation and Navy Memorial on 13 April 2005. Speakers included CDR Phil Eckert, USN (Ret.), a member of the wardroom of USS ARGONAUT (SS-166) when they landed "Carlson's Raiders", COL John Ripley, USMC (Ret.), a Marine Reconnaissance Officer who operated from submarines during the Cold War and CAPT Rick Ruehlin, USN, Program Manager for Naval Special Warfare. The trio provided a thrilling look at SEAL operations from submarines yesterday, today and in the future. Next year we have lined up a series of speakers to address the fiftieth anniversary of the Strategic Systems Program. This will be an excellent historical review as well as a discussion of the future of the Strategic Program. Put 11 April 2006 on your calendars for this program at the Navy Memorial.

The League is continuing to address issues that make it relative to the transitioning environment of the Submarine Force. I ask that you let me know your ideas of what the League can do to help promote submarines and their contribution to national defense in your areas of influence. One of the easiest things you can do is to advise your friends and associates to join the League. You can do this easily by referring them to our webpage,

www.navalsubleague.com and click on "Join NSL".

I ask that you join Jan and me as we continue to pray for the safety of our troops deployed around the world. I am honored to continue to represent you as President of the Naval Submarine League.

J. Guy Reynolds
President

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Fifth Annual Submarine History Seminar

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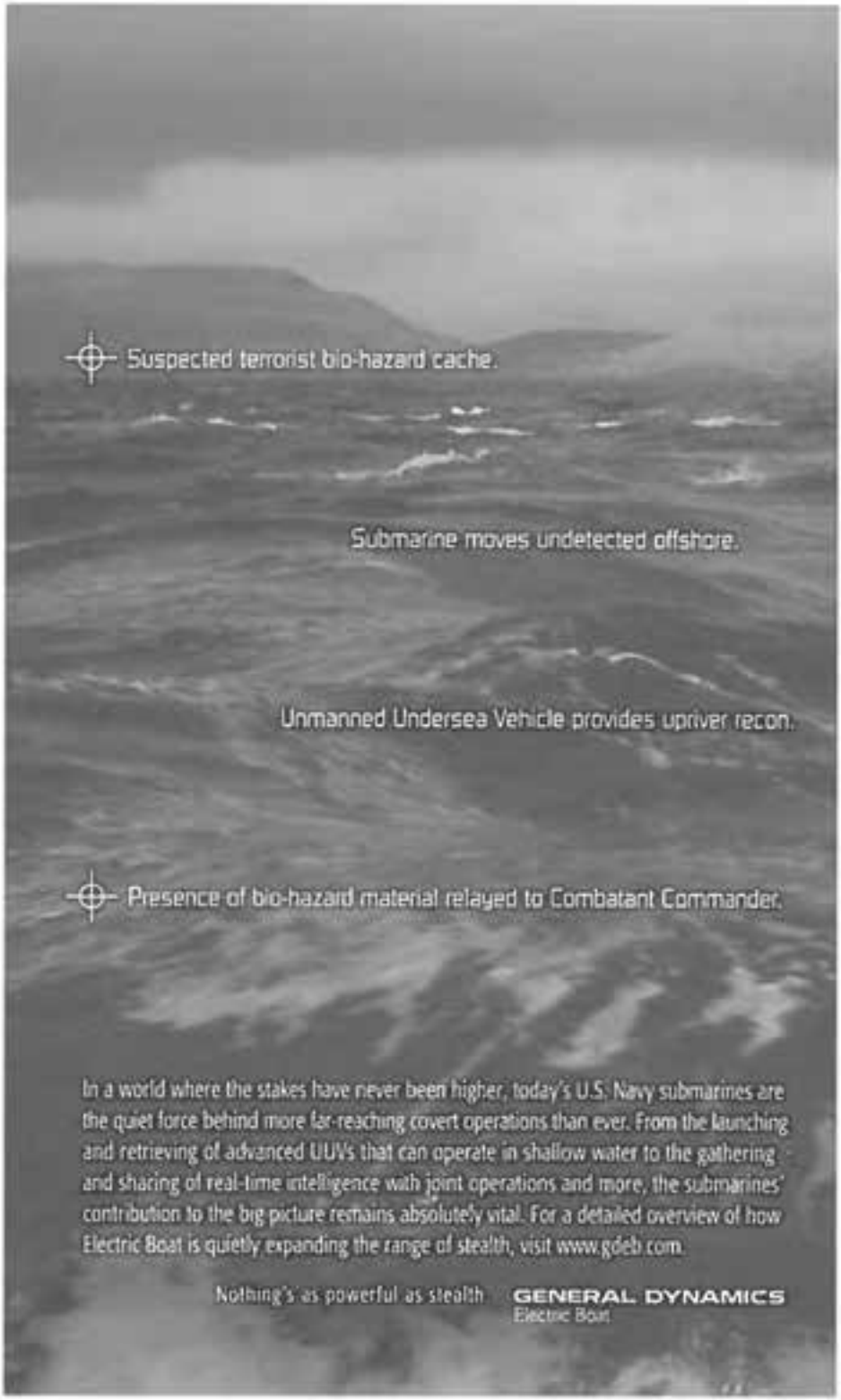

In a world where the stakes have never been higher, today's U.S. Navy submarines are the quiet force behind more far-reaching covert operations than ever. From the launching and retrieving of advanced UUVs that can operate in shallow water to the gathering and sharing of real-time intelligence with joint operations and more, the submarines' contribution to the big picture remains absolutely vital. For a detailed overview of how Electric Boat is quietly expanding the range of stealth, visit www.gdeb.com.

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FEATURES

ON CLOSURE OF SUBMARINE BASE NEW LONDON

by Admiral Bruce DeMars, USN(Ret)

The Navy BRAC recommendation to close Submarine Base New London is unthoughtful. The submarine force level study used to support the recommendation is not defendable and no consideration was given to the impact on the cost of building submarines at Electric Boat.

This naval administration has indicated that we have the wrong Navy—they prefer smaller, swifter surface ships rather than aircraft carriers and submarines. While not subjecting the matter to open discussion, they have taken many actions to advance this premise. The recommendation to close the Submarine Base is the most unthoughtful of the lot.

The attack submarine force level has undergone some 14 studies in the past 12 years. The current Navy study came up with the lowest number. It had essentially no submariner input, no input from the Fleet Commanders and inadequate peer review. This contrasts with the Office of the Secretary of Defense (PA&E) study of one year earlier. This study included submariner input, Fleet Commander input and was properly peer reviewed. It reached a number some 20% higher. I have some experience with such studies. The Navy study does not meet professional standards and is not defendable.

Another matter in which I have some experience is the cost of submarines. The Navy has been pressing Electric Boat to reduce the cost of new construction submarines. Some progress has been made. In the 90s, I encouraged Electric Boat to take over the maintenance activities at the Submarine Base. It has worked well and reduced overhead at Electric Boat some $50M per year. If the Submarine Base closes, this advantage is lost and the cost of new construction submarines will rise. I have trouble believing the Navy considered this long term impact on the industrial base.

Other less quantifiable issues revolve around synergies. The Submarine Force is small with only some 30,000 submariners in the Navy. Driven by the exigencies of the platform they have always

been a compact organization with relatively low overhead.. Support groups reside near the waterfront to better reflect the realities of the boats. This closure would scatter these groups, removing some from direct contact with the waterfront.

The Submarine Force is important to the defense of our national interests. It has the only truly stealthy platforms in our armed services and is the heart of our strategic nuclear deterrent. It has adapted to the changing nature of naval warfare for over 100 years. It is a rare asset and sets our Navy apart. The closure of the Submarine Base will not mean the end of the Submarine Force but it will start many years of unnecessary churn. The recommendation to close the Submarine Base is not well founded and should be overturned.■

SUBMARINE CAPABILITIES FOR THE 21ST CENTURY
REMARKS BY ADMIRAL K.H. DONALD, USN
SUBMARINE TECHNOLOGY SYMPOSIUM
JOHNS HOPKINS, APL
TUESDAY, 17 MAY 2005

George – thank you for that kind introduction. ADM DeMars, ADM Chiles, Dr. Roca, fellow flag officers, and distinguished guests welcome and it is a pleasure being here. Admiral Emery, to you and your supporting cast, thank you for all that you did to make this a success. I have always particularly enjoyed this forum because it attracts the best thinkers and technologists in our business, and it always seems to spur substantive presentations and discussions. I also thoroughly enjoy coming to the Applied Physics Laboratory here at Johns Hopkins University. Long a contributor to the Silent Service, APL has a storied past, present, and certainly future in making submarines an increasingly dominant presence on the future battlefield. I am truly honored to be here to address this distinguished group.

Let me begin my discussion today with comments on the focus of this symposium—Submarine Capabilities for the 21st Century. First let's take a fix on where the Navy is today. Simply put, the nation has the best Navy this world has ever seen. Its ability to surge, to project offense and defense is unmatched. We have superb ships and equipment. We have well-educated, trained, and motivated Sailors who value their careers in the Navy. The Submarine Force is a vital arm of the nation's maritime forces and they demonstrate it every day. Operating in every theater across the broadest spectrum of missions and going places where others cannot go and doing things that others simply cannot do. They are ready to strike with lethality when necessary; or they can operate undetected and undeterred, developing maritime domain awareness in critical areas of potential future conflict. We can all justifiably be proud of our great skippers, their crews, and the supporting organizations for their remarkable performance! Submarines are on the point in the maritime domain.

However, there are many challenges both here and now and looming on the horizon. We are at war, after all, and the end of that conflict is indeterminate at present. We, as a nation, must ensure that our troops on the front lines have everything they need to win. Costs of war, deficit reduction, rising personnel costs are all exerting pressures on budgets at the very time we are striving to recapitalize following the post Cold War procurement holiday. If that weren't enough, our leadership is engaged in the QDR where we will set the strategic course for the Department of Defense.

Add to that a BRAC and a substantial turnover in our leadership this summer and we have the formula for very interesting times. The Submarine Force is facing its own set of challenges with numbers of hulls declining while the Combatant Commanders demand for the unique capabilities that they bring continues to outstrip what can be delivered by the Fleet Commanders. The Force is aging and with that comes the challenges, some known; some, no doubt, are unforeseen as we work with more mature platforms.

My message to you, to all of us, today, is that with all these challenges and uncertainties, it is even more incumbent upon us to push the limits of what technology can offer in war-fighting capability, in efficiency, and effectiveness of operations, training, logistics, procurement, and maintenance. When technologies show promise, we must strike a balance between aggressively pushing them to the hands of the war-fighter while at the same time, doing so in a disciplined, rigorous manner such that we know what capability is real and what is *PowerPoint*; what costs really are versus what we want cost to be. I am optimistic because we have been down this road before, and there are examples of how to do it right! We must deliver products that can be counted on and we must continue to develop advanced technological solutions that drive our advantages – and, speaking for myself, we cannot relent in the standards of effectiveness for safe nuclear propulsion operation.

I look back at the history of my own organization and see examples of pushing the technological envelope, of taking well reasoned risks, and managing that risk to deliver real capabilities to the war-fighter. Fifty years ago, on January 17, 1955, USS NAUTILUS (SSN 571) put to sea and signaled the now famous report, "Underway on nuclear power." NAUTILUS revolutionized undersea

warfare by freeing the attack submarine from the air-sea interface, allowing essentially unlimited endurance, and the true stealth afforded by the submerged environment.

With the commissioning of USS ENTERPRISE in 1961, naval aviation experienced an equally dramatic leap forward in capability. No longer tied to slow at-sea supply lines, and with immense propulsion power immediately available, the aircraft carrier and - more importantly - the decisive air power of modern naval aviation, could be responsive to war fighters' needs in unprecedented ways.

As aviation and undersea capabilities have advanced, so have the value of these imposing symbols of national power. Just a couple of weeks ago, on May 3rd, USS NIMITZ (CVN 68) celebrated 30 years since her commissioning.

These particular accomplishments accompany 5600 reactor *years* of safe operation and over 132 *Million* miles steamed on nuclear power—while our forces have executed missions critical to national security.

While it is momentarily satisfying to reflect on Naval Reactors' rich history of providing safe and effective nuclear propulsion, we cannot rest on our laurels. If we are to be relevant, we must continue to look forward.

No crystal ball exists that can exactly determine the form, function, or capability of future adversaries our Submarine Force will be called to engage.

We talk a lot about fourth-generation warfare these days – the use of asymmetric means by non-state actors to further military and political goals. The ongoing IRAQI insurgency is a ready example of this asymmetric threat.

But asymmetry cuts both ways. We too have tremendous *asymmetric* advantages – *readiness*, *advanced technology*, *dominance of the maritime domain* and the *genius of our people*. These strategic asymmetric advantages directly translate to the more tactical asymmetric advantages—*mobility*, *speed*, *sustainability*, *stealth* and *adaptability*, and the value of these advantages is becoming more and more important.

For example, the Navy today is counted on to be ready to surge forces in unprecedented ways anywhere on the globe to rapidly amass decisive combat power. We are expected to cover great

distances quickly, to be able to arrive on station fully ready, and to be ready to remain on station for as long as it takes to win decisively.

Effective sea basing will demand mobility, sustainability, and adaptability. As our numbers of ships decrease, the premium on flexibility, speed to the fight, and endurance goes up. As geopolitical uncertainties cast shadows of ambiguity on our ability to count on forward bases on foreign soil—endurance, adaptability, and sustainability become things we want more of.

Responsiveness is all about having the capabilities in place to take advantage of operating in *our* maneuver space—the maritime domain. Readiness is assured through smart investment in the *right* advanced technologies to provide the warfighter the asymmetric advantage he requires. Readiness must also make sense, from a perspective of return-on-investment, to ensure that scarce resources *maximize* operational punch—now and in the future.

I am confident that we are delivering what the Fleet needs in reliable, safe propulsion power for our capital ships. And we continue to improve the operability and affordability of our plants. Given my prior discussion, nuclear propulsion should clearly have a key strategic role in our future.

Using the strategic concepts that form the future capabilities vision as our template—here is what we at Naval Reactors are doing to ensure the Relevance, Responsiveness and Readiness of our nuclear forces in these fluid times.

Plant designs, each building on the lessons from the previous, have become simpler, more reliable, and maintainable. The original core of NAUTILUS lasted two years—our submarine cores now last the life of the ship.

CVN-21 will have nearly three times the electrical generating capacity of its predecessors—yet will require only 25% of the cabling to distribute that power throughout the ship. Further, we believe we can safely reduce the Reactor Department manning on CVN-21 by 50% when compared to the NIMITZ-class carriers.

This month, I witnessed the successful high power steaming of the turbine generators designed for CVN 21. When at sea, they will be the highest power steam turbine generators for any maritime application.

We are upgrading our reactor instrumentation and controls

electronics to a generic system that uses essentially identical hardware for multiple plant designs. The differences in operating characteristics of the plants are accounted for in the software. This improves the maintainability and affordability of our nuclear fleet, and allows flexibility to respond to advances in technology.

We continue to develop and field reactor instrumentation and control that is the envy of the commercial nuclear industry. Our common building blocks for submarines and carriers are approaching commercial industry costs, and are being adopted for non-reactor applications due to their ability to mitigate obsolescence in a robust, rugged package.

VIRGINIA's power plant has fewer valves, pumps, and circuit breakers, and improved control systems, that allow us to reduce watchstanding requirements. In the reactor plant—for the first time - we were able to advance the engineering of acoustic stealth while reducing hull size. In total, design improvements—to include a simplified propulsion plant and a reactor compartment designed for full modular construction and shock mitigation—yielding construction labor hour savings of 25% over SEAWOLF.

And we are still pushing the technology envelope to give the warfighter the tools he needs to keep our force *ready, responsive and relevant*. Recognizing the potential increased energy needs of our ships to power future advanced sensors, weapons, and unmanned vehicles—and to ensure we can sustain worldwide surge readiness over the lives of our ships—we are developing a core that provides 1/3 more energy in the same volume as a VIRGINIA core. We call it the Transformational Technology Core (TTC). With significantly more energy, we can increase core operating hours per year, and allow operation at a higher average reactor power. The Transformational Technology Core (TTC) will give us greater operational capability and mission flexibility.

Looking further into the future, we have multiple initiatives underway that converge about similar technological challenges. NASA has asked, and DOE & DOD have agreed, for Naval Reactors to develop the nuclear power plant for deep space exploration project PROMETHEUS. We are also investigating technologies leading toward a direct energy conversion reactor plant that eliminates the steam cycle, converting nuclear energy directly into

electricity. In this effort, we are the world leaders in improving cycle efficiency from a meager 4% to in excess of 20% ... approaching that required for a viable energy source. These projects involve the use of high temperature fuels and materials that simply have not been used anywhere in practical applications.

Affordability is an essential ingredient of good engineering. Through initiatives we have streamlined inspection processes, reduced unnecessary or redundant manufacturing steps, and reduced cycle-time. For example, we challenged our sole reactor core manufacturer to reduce the cost of the cores by 5% without sacrificing quality or safety. As a result, through innovative use of on-hand materials and streamlining processes, we have been able to reduce core manufacturing funds by approximately $82.2 million (which is 12.7%). This reduction is good, but there is still much work to be done.

It is also important for the system to know that we are watching and for us as an agent of the government to *push back* on vendor proposals that simply reflect the status quo. We at headquarters approve any cost type contract over $250K and any fixed price type contract over $1M. This process allows headquarters visibility of the entire procurement process and enables us to stress appropriate cost cutting measures while ensuring all the building blocks fit into the bigger picture, a key to efficient execution.

Over half a century of successful nuclear propulsion operations is a testament to a well-designed process. However, throughout my Navy career, I have usually been most uncomfortable when things are going well, because I question what problem we've missed and what opportunity we've overlooked.

No organization can continue to succeed if it is satisfied with the *status quo*. Therefore, we must continually assess where we are, where we want to be, and what is preventing us from getting from one point to the other.

As I survey the state of the community, I have two areas of concern that I want to share with this forum.

Navy shipbuilding and the industrial base that supports it have received a fair amount of press in recent weeks. The current state of the industrial base, and its outlook for the future, are important issues that require more attention than they have received.

I have a particular interest in, and concern about, the nuclear sector of the industrial base. The truncation of the SEAWOLF program made it necessary for us to restructure the nuclear component industrial base, moving from a substantial number of competitive manufacturers to a largely sole-source environment. For example, in 1990 we had 18 nuclear component vendors and today we have 11. Similarly, in 1990 we had 5 valve vendors and now we only have one. We have excellent relations with today's remaining vendors, who continue to be responsive and quality-oriented in their nuclear work. Many of these companies have been with the Program since the early days. A more patriotic and dedicated group is hard to find, and I am very proud of what they do.

There is, however, an inevitable cost that comes with a small, dedicated, predominantly sole-sourced industrial base. Fixed overhead is now spread over fewer units—making each unit more expensive - despite solid efficiency gains.

With a predominantly sole-source industrial base, we become vulnerable to vendor-specific challenges such as labor disputes, financial instability, production quality issues, and vendors deciding to exit the business.

The Government is responsible for communicating stable requirements—and we have not always done that as well as we could. As a result, our vendors have become more fragile, more sensitive to churn, and to some extent more skeptical of us.

For example, the starting date for a two-per-year VIRGINIA Class build rate has changed seven times since 1995. In the midst of these changes, some of our vendors had invested significant capital in order to be prepared to quickly support a Government decision to ramp up to two VIRGINA Class submarines per year.

Unfortunately, today's production bears the burden for this future flexibility. The increased direct and indirect costs associated with the ability to ramp up in the future appear in the price of components, and therefore submarines, being delivered now. As the price of todays submarines goes up, so does the pressure to once again slide the build rate to the right—making this something of a self-defeating exercise.

These challenges are not unique to submarine work. Just as industry has been postured to increase the Virginia Class build rate,

so too is it expected to maintain the capability to ramp up to a new construction aircraft carrier every four to five years. Instability in the submarine industry has an immediate effect on the aircraft carrier industry, and vice versa.

Market efficiencies have a significant impact in this discussion, as do sunk costs. We have clearly seen that reducing procurement rates on major Submarine and Carrier construction platforms to save money—or shifting start dates on new construction—does not correlate to a direct dollar for dollar savings. As an example, OSD's Program Budget Decision 753 postponed the two-per-year VIRGINIA build rate from FY09 to FY12. The shipbuilder overhead previously borne by the submarines had to be shifted to the CVN 21 Class Program, increasing the CVN 21 program by $110 million. I have been using an example from the specialized nuclear component industrial base to illustrate what I consider to be a major issue for the larger shipbuilding industrial base.

Our shipbuilders must maintain a large and varied labor force from day-to-day, while at the same time hiring and training the next generation of tradesmen. Many of these tradesman are not interchangeable; they often have critical skill sets that cannot be easily replaced if lost.

I am particularly concerned about the precarious state of our national resource of submarine and nuclear designers and engineers. For the first time since the end of the Second World War, we do not have a new submarine design underway. As we come off the peak from VIRGINIA and SSGN design, without new work, this pool of uniquely skilled talent will atrophy.

While some mitigation can be achieved by taking on non-submarine work both inside and outside the Navy, it is no replacement for the unique demands of nuclear submarine work. We have, in the past, experienced some atrophy in and subsequently ramped up our shipyard design and engineering workforce. For instance, we did it to design the SEAWOLF and OHIO classes. But, we started that ramp up from a *critical mass*— and even then it came at a price to rebuild key talent. We are currently on a glide slope to go below that *critical mass*—and potentially to dismantle this national treasure of expertise.

My goal in touching on the industrial base is to highlight the

importance of all parties—government and industry alike—to carry out their responsibilities effectively. The industrial base is most efficient, and the Government receives the most return on investment, through having a clear vision of what capabilities our Navy must have - by translating vision to requirements, requirements to programs ... and by executing a stable program in an efficient, effective manner.

One solution to the design and engineering industrial base issues that you may hear involves a proposal to design a new submarine—a cheaper, lighter, better, smaller ship to replace VIRGINIA and allow us to build more of ...whatever these things are supposed to be. While well intentioned, the proposals I have seen are very long on the hope that technology will solve some very difficult challenges that tend to drive costs in submarine manufacturing, and real short on technically executable, and affordable solutions.

I'll let the operators argue the efficacy of what this *sub-lite* might do...but speaking from the point of view of the program director—an acquisition guy... a technical guy—that discussion doesn't hold much appeal to me.

I am sure I could be painted with the *Luddite* brush—but the idea of giving up R & D, design, and engineering investment that delivered a ship with the tremendous capability, and potential capability, of a VIRGINIA *before* amortizing our investment over a class of ships and *before* driving the efficiencies into the construction process that comes with repetition and a learning curve—just doesn't make much sense. Additionally, I tend to fall back on my theory of *wing walking* when I am approached with a promising technology that will cure the ills of the existing program. I may be interested; I may even be a proponent. But I don't believe in letting go of our real capability, particularly one like VIRGINIA that we are just getting into the fleet, betting that I will be able to reach out and grab some ever-moving, elusive technological promise that just may not be there when I need it most.

Instead, let's focus on that valuable and proven design. Focus the talent of our designers and engineers on driving cost out of VIRGINIA where it *makes* sense, on adding capability and/or flexibility to that platform!

I would offer that if we are going to start looking at a new

submarine design, it's approaching the time where we need to start the discussion on the replacement for our SSBN, and possibly the newly emerging SSGN force. After all, there appears to be growing recognition that the value of these ships is on the rise in the context of a national deterrent force. With another 20 years of life coming with the mid life refueling of the OHIO Class, some may think this is a decision better left for tomorrow.

With a design industrial base at risk and a complex decision making process that will require time to resolve policy and technical issues beyond mere hull design, the time to start the deliberations is probably closer than we all think.

The second area of concern that I wish to address today has to do with a growing debate over the utility of conventional submarines in the US Navy.

There are those who are again questioning whether we can afford nuclear powered submarines when conventionally powered subs with Air Independent Propulsion seemingly have all the advantages at less than half the cost.

I welcome this debate. But it must be done with cold hard facts, not rhetoric. So let's remember a few of the facts that rarely make the rhetorical headlines.

Current designs for conventional powered submarines fall victim to the engineering tradeoffs inherent in a non-nuclear design. For example, these vessels would have a submerged endurance of about 4 days at less than 5 knots. This endurance degrades rapidly to just hours for any appreciable speeds above 15 knots.

While AIP can extend the endurance as much as 14 days at less than 5 knots—and as long as a month if the vessel remains stationary and reduces electric loads to the bare minimum—these low power levels disallow concurrent use of robust sensors and weapons suites.

In addition to purely nuclear standards, there are additional engineering and performance standards to which U.S. submarines are subject.

Current SSK designs do not adequately address standards to accommodate the SUBSAFE program, shock testing, 3-Section watches and at-sea training.

Factoring in these performance standards, the cost of one of these conventionally powered submarines is significantly greater that the

half-price estimate—rather, they approach a cost more on the order of $1.5 billion a piece.

In fact, the acquisition premium for constructing a submarine with VIRGINIA capabilities that is nuclear powered versus conventionally powered is about 25%.

If one accounts for the cost of fuel oil, which at today's **unburdened** rate is about $130 million, the premium is only about 20%.

It is hard to imagine questioning the value of this premium to allow the capability to arrive on station with unlimited stealthy endurance.

The alternate to a nuclear powered vessel is one that arrives on station having to refuel, loiter at slow speeds at reduced electrical load, and work within the tactical confines of a submerged endurance of less than a week at 3 knots.

From a strategic perspective, there are additional costs associated with building a submarine without *legs* and on-station sustainability. This is the cost of forward basing—which is an entirely different subject. My take is that the 25% premium of a modern nuclear submarine is money well spent.

Given these performance issues there needs to be a very thoughtful assessment of an SSK's capability for the types of missions that are virtually taken for granted with an SSN

My concerns over the direction of the debate on a low-cost alternate to submarine acquisition transcend my duties as the Director of Naval Nuclear Propulsion. These are concerns that are shared by all of us who are warfighters and understand the tactical realities I have highlighted above.

We are—after all—a maritime nation with a global reach whose doctrine of *forward presence with a purpose* requires vessels with the capabilities I have just articulated. To me, it doesn't make much sense to build a future submarine force on a vector toward *tactical parity* with a potential peer competitor.

I understand that readiness cannot come at any cost. Our leadership has made that clear.

This is why Naval Reactors is *embracing* technologies that provide maximum return-on-investment, enable readiness and ensure responsiveness for current and future platforms - while maintaining our bedrock standards of safe and reliable nuclear propulsion.

Aside from the obvious tactical, operational, and strategic advantages, I believe the business case for nuclear power for capital ships is convincing *today*. The historic operations and support costs for the USS NIMITZ (CVN 68) are only about 10% more than those for USS JOHN F. KENNEDY (CV 67). However, nuclear propulsion provides unmatched warfighting capability, mobility, sustainability, and nearly unlimited endurance—the asymmetric advantages I mentioned earlier.

As you will recall in the days following 9/11, it was USS ENTERPRISE—our first nuclear carrier—that arrived on-station literally hours following the terrorist strikes - to deliver the nation's response against the Taliban of Afghanistan. She was accompanied by USS PROVIDENCE (SSN 719)—whose presence enabled this rapid response and the strikes to follow.

Speed, mobility and sustainability to provide readiness, responsiveness and relevance—these are the products that a nuclear enabled Navy provides the taxpayer.

Yes, there are challenges ahead. But given the talent, ingenuity, and dedication resident in the program—and in this audience—I am confident in our collective ability to deal with these challenges and to keep them transparent to the warfighter.

We are moving forward with advanced technology so you can depend on it being there—what ever that form may take—for future submarine platforms and associated capabilities. We will not relent in our mission to provide safe and effective nuclear propulsion for the warships of this Navy.

I challenge this audience to leverage these technologies, and embrace the importance of continuity of purpose in this endeavor.

Good men and women, thank you for your dedication to our Submarine Force, the innovations that allow us to succeed, and your assistance with our readiness to represent and protect America's interests all over the world.

Your individual commitment to our group effort in defending this great Nation is noted and appreciated.

Thank you!■


The sea dominates the Earth.
This dominates the sea.
It runs silent; it runs deep. The Virginia-class attack submarine is the most advanced undersea weapons system in the world. This nuclear-powered submarine comprises an innovative mix of technology, flexibility and combat effectiveness. Designed to meet changing missions and threats, it is at the forefront of the Navy's push to maintain 21st century sea superiority. Northrop Grumman Newport News is proud to be a partner on the Navy's next-generation submarine. It's one reason there will always be something in the water that keeps America strong.
NORTHROP GRUMMAN
DEFINING THE FUTURE

INNOVATING FOR A SAFER WORLD

STATEMENT OF VADM CHARLES L. MUNNS, USN COMMANDER NAVAL SUBMARINE FORCES BEFORE THE HOUSE ARMED SERVICES COMMITTEE SUBCOMMITTEE ON PROJECTION FORCES ON THE NUCLEAR SUBMARINE FORCE – PAST, PRESENT, AND FUTURE

13 JUNE 2005

Mr. Chairman and distinguished members of the Subcommittee on Projection Forces, I am Vice Admiral Charles Munns, Commander Naval Submarine Forces. I want to express my gratitude on behalf of the men and women of your Navy for holding these hearings. It is a privilege for us to be here today. I have a detailed written statement for the record I can read, but I am also prepared to summarize that in a shorter oral summary if you would prefer. Thank you, I plan to take about 10 minutes.

I probably have an uncommon perspective, having spent 12 years underwater. And from that perspective, I believe undersea warfare is not well understood by most of the public. Therefore we appreciate the opportunity today to tell our story. My remarks will be unclassified, however we would be delighted to present classified details to the committee at a future time.

I'll briefly describe 1) the strategic landscape, 2) the health of the force, 3) the product and value we produce, and then 4) suggest a few future capabilities.

I. The Global Strategic Landscape - Strategic Challenges

First, America is a Nation at war against Terrorism. Secondly, we live on an ever-changing landscape and it will evolve in uncertain directions over time. Our task is to positively influence both terrorist enemies and this fluctuating political landscape. We must certainly win the battles and wars we face—but even better is to act to prevent the conflict—or if conflict comes to shape it to our terms. This is the world in which your Submarine Force operates, this is our mission. We do it in coordination with other elements of US power, the Intelligence community, the combatant commands, and the Navy. We

do this clandestinely, with mobility, and persistence in the troubled littorals of our world and we do it far away from our shores.

II. Health of the Submarine Force

Having given a glimpse of what we must do today and into the future, let me now report on our readiness today.

Our nation has the best Submarine Force in the world and in all of history. We have built upon a strong legacy of selecting and training the best people, building and maintaining the best ships, and equipping them with the latest technology. This recipe has helped us win our Nations conflicts and wars for 105 years.

Our people are the cornerstone of our Force. They are talented, they are motivated, and they have chosen to serve their Nation in a submarine. They are better educated today than in the past. Submariners feel a sense of purpose. They are out on the front line everyday, they know what they do is important. Each is imbued with the legacy of Admiral Hyman G. Rickover, that "Excellence is Standard".

The ships we operate are not only the most capable in the world, but they are cost effective as well. These nuclear powered ships are launched with a full tank of gas that lasts for the life of the ship.

We are innovators. In the late 1990's we embarked on an effort to replace our legacy sonar systems with Acoustic-Rapid Commercial-Off-The-Shelf (COTS) Insertion (ARCI). COTS enabled us to upgrade our software and hardware every few years at a fraction of the cost required to replace our legacy system. This effort has been so successful, we have expanded it to our tactical fire control, radio room, electronic surveillance equipment, navigation, periscope, and torpedoes.

We are fully ready to win in combat with the Joint Force. However, submarines also produce real value day-in and day-out. In 2004, we deployed 27 submarines throughout the world on lengthy operational deployments. The rest of the SSN Force was either in deep maintenance or getting ready to deploy this year. These submarines provided a product. Additionally, the preponderance of our SSBN force is

underway, underwater, in a completely survivable posture, and ready to respond to the President's tasking. Submarines supported every regional Combatant Commander along with Strategic Command and Special Operations Command. Submarines were sent where they were needed most and transited the North Pole, Cape of Good Hope, Panama Canal, and Suez Canal to get there. Our Submarine Force is doing our Nation's work every single day.

But while the Submarine Force is robust today its future cannot be taken for granted. What keeps me awake at night is ensuring our ability to keep doing this in the future. The last QDR specified a minimum force level of 55 SSNs necessary to fill Combatant Commanders' high priority needs. Other studies continue today to refine the numbers. Possibly the best yardstick is the Combatant Commander deployment requests, which exceeds what we can provide with the current Force. The problem however, is that the current VIRGINIA Class SSN build rate will take us well below any of these levels. We are actively working to make the VIRGINIA SSN build rate more economical to make the Future Force more affordable.

Our ability to build enough submarines each year to maintain this level will require a national shipbuilding, design and maintenance infrastructure strategy. This is one of our Nation's crown jewels and it will take all of our attention.

III. The SSN Value Chain

I've described the world we should expect and our readiness – let me now comment on our product and the value of what we do.

Enabled by nuclear power, submarines stealthily and persistently go where others cannot. We operate in shallow water, under ice, and in congested areas and in extreme weather conditions. We stay on station a long time. The five attributes, which enable submarines to deliver unique value to our Nation are:

Stealth
Persistence
Agility
Mobility
Payload

The Submarine Force provides value across the spectrum of conflict. On one end are *Phase Zero* operations. These are operations to shape the environment and prevent conflict or set conditions to engage conflict on our terms. At the other end of the spectrum are combat operations. I'll discuss the latter first.

During combat operations, submarines can conduct theater strike and/or Global Strike with kinetic and non-kinetic weapons precisely on targets—torpedoes, cruise missiles, ballistic missiles, special forces and information operation effects. These are our more common and understood effects. I won't belabor them.

Let me shift to the more important, more sensitive, and less understood piece. I call it Phase Zero operations. Phase Zero operations are knowledge gathering, shaping, or combat preparation operations. Phase Zero is not just the day before conflict. It is not just a single mission. It is the work done day-in and day-out, year-in and year-out by many ships to better understand the global strategic environment. The ultimate goal of phase Zero is to ensure United States national interests are achieved. To do it without combat, if possible and if combat is required that we can strike out from a landscape and an environment that we understand.

A vivid example of this is the Cold War. Soviet uncertainty regarding our submarines' location, deployed force strength and capability resulted in strategic effects. These effects were achieved over 40 years by working day-in and day-out in places where others could not go to understand the environment and the adversary that others could not see. Likewise, today we are engaged in Phase Zero operations for terrorist cells, drug rings and a number of other potential Nation State competitors. We do this by going to places and in a posture that others cannot.

In each of these areas the formula is the same, to *walk the field* so we understand them, influence their course if needed and be ready to respond with confidence should deterrence and shaping fail.

I have thus far discussed what we do and how we do it. Let me now mention the effects. I'll discuss four:

Equipment design
Tactics
Planning
Decision-making

First, the design of our equipment we take to the world's hostile littorals is a direct result of submarines operating day-in and day-out in these environments. We collect all spectrum information, which is used by our scientists to design equipment to work in and exploit this **REAL** environment. This develops better sensors, processors, weapons, and defenses. By these actions our Submarine Force is more capable but so too is the Navy, Department of Defense, and other government agencies.

Secondly, we develop new tactics based on our experiences. These allow us to thrive in the littoral and for the maritime joint forces continued access for combat.

A related benefit is that we operate in the same areas where we could potentially fight. We are constantly honing our skills and sharing the lessons learned across the fleet.

Third, the information we collect feeds directly into Combatant Commanders' deliberate planning process. The knowledge we provide of terrorists or of potential enemy capability and intent enables the warfighters to develop executable plans. It's no wonder Combatant Commanders are collectively asking for many submarine missions. They currently want 150% of the *critical* mission days that we can provide.

And fourth, at the highest levels of our government, decision makers utilize the information we gather, among other sources, to aid in determining *ground truth*. This ultimately leads to strategic direction for our Nation's security.

I prefaced this section with submarine attributes, which in combination enable unique capability: stealth, persistence, agility, mobility, and payload. As we make decisions about the future of the Submarine Force, we need to preserve these attributes. They should be the primary criteria upon which we evaluate the adequacy of any new design.

IV. Needed Future Capabilities

Now turning to the future... If you permit me to dream a bit I would opine that the capability this Nation needs is defined by a sufficient number of submarine hulls each with attributes described in the previous section and with some increased capability for:

Enhanced connectivity and
Utilization of distributed sensors and weapons

We are working to provide submarines with communications at higher speeds and increased depth.

We also want to make better use of the new payload volume we have for stealthily delivered sensors and weapons. We already have the SSGN, the SEAWOLF class and VIRGINIA coming online with large payload volumes and ocean interfaces. We are experimenting with this payload volume to deliver unique, enhanced capability.

I envision one of the payload sets to be knowledge and shaping tools. These will include networks of distributed sensors and weapons, which allow us to better understand and affect a larger area. Whether they are sensors, unmanned or manned vehicles, non-kinetic weapons, or kinetic weapons, they will inherit the submarine's unique attributes of: stealth, persistence, agility, and mobility. And they will reap the same benefits I have discussed today.

Finally, we must continue to improve the sensors installed on our submarines. We have refined the twin thin-line towed array systems on our SURTASS ships and need to transfer this enhanced capability to our submarines.

V. Summary

The Submarine Force should continue to be utilized forward, as scouts *walking the field* in many places. Day-in and day-out, we must conduct Phase Zero operations, grasping for ground truth and shaping the environment to avert the next conflict or should it occur, be ready to engage quickly and decisively on our terms. By making optimum use of the very talented people of the Submarine Force, and taking advantage of fundamental attributes: stealth, persistence, agility, mobility, and payload, we will continue to provide our country with an exceptionally unique and powerful capability.

Thank you very much for your time today.■

SUBS DRAW VARYING VIEWS

As Navy Leadership Pushes to Reduce The Fleet, The Head Of Submarine Forces Urges Caution

Newport News Daily Press 14 Jun 05

by Mr. David Lerman

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GROTON, CONN.–The Navy's top commander of Submarine Forces told a congressional panel Monday that today's fleet of 54 attack submarines will be needed in future years, contradicting the Navy's own long-range shipbuilding forecast that calls for shrinking the fleet.

Pressed by lawmakers who are pushing to increase submarine construction, Vice Adm. Charles Munns said a smaller fleet would be problematic because combatant commanders already ask for about 50 percent more daily submarine missions than he can provide.

"My sense is where we are today—54 submarines—is about what we'll need in the future," Munns told the House Armed Services subcommittee on projection forces, which held a field hearing at the submarine base here.

That assessment runs counter to the conclusions of a preliminary 30 year shipbuilding plan, issued in March, that calls for gradually reducing the fleet to as few as 41 attack submarines. Congressmen warned the fleet would drop to as few as 30 submarines if the current procurement rate of one boat per year is not increased.

Senior Navy officials have said the high cost of Virginia-class submarines - about $2.5 billion per copy—and the lengthy time required to build a submarine—about six years—may make it impossible to sustain today's fleet. They have also said new technologies and manning policies—such as rotating crews off and on ships kept deployed overseas—could allow the Navy to maintain global presence with a smaller fleet. But the new assessment by Munns came as music to the ears of Congressmen from shipbuilding states such as Virginia and Connecticut, which faces the possible closure of Submarine Base New London.

"The projection of going down to 30 or 40 submarines is too low

and it places too much risk on our sailors and our security," said Rep. Rob Simmons, R-Conn., who is fighting the closure of his district's submarine base. "Whoever came up with the lower numbers were not submariners."

Virginia Rep. Thelma Drake, R-Norfolk, a new member of the subcommittee, said, "Everything I've heard leads me to believe we have not made the proper balance in terms of the number of ships."

Munns, who is based in Norfolk, described a highly capable Submarine Force that is stretched thin by a growing number of intelligence missions around the globe, as part of the war on terrorism.

"What keeps me awake at night is ensuring our ability to keep doing this in the future," Munns said. "The knowledge we provide of terrorists or of potential enemy capability and intent enables planners to develop more realistic and effective operations plans. It's no wonder combatant commanders are collectively asking for more and more submarine mission days."

Any effort to sustain today's fleet could mean more construction work for Northrop Grumman Newport News and General Dynamics Electric Boat, in Groton—the nation's only two submarine builders. Avoiding a decline in the fleet would presumably require the Navy to begin buying two submarines a year sooner than planned.

The effort to double submarine procurement has been postponed repeatedly in recent years and now is not slated to begin until at least 2012. It's not clear how Congress could find billions more dollars to finance submarine construction in the near future, as President Bush seeks to slow the growth of defense spending to reduce the deficit.

Rep. Roscoe Bartlett, R-Md., the subcommittee chairman, stopped short of declaring the navy's long-range submarine plans inadequate. But he made clear his desire for a reassessment that would preserve today's fleet.

"I think we need a new look at what the Navy needs in the future," Bartlett told reporters.

Simmons, who requested Monday's hearing to highlight the state of the Submarine Force, said the Chinese submarine fleet will outnumber the U.S. fleet by a margin of 2 to 1 within five years. "At some point, numbers count," he said.

But Rear Adm. John Butler, who overseas submarine construction for the Navy, downplayed the Chinese threat. Most of China's

submarines, he said, are smaller, diesel submarines designed for coastal defense. Navy officials also bemoaned the declining state of the shipbuilding industrial base, which they said does not have enough construction and design work to operate efficiently and cost effectively.

For the first time in decades, there is no plan for a new submarine design on the drawing boards.

"In terms of submarine designers, we're on the precipice of a national disaster," Butler said. "There are skills that do atrophy and don't come back."■

BANQUET ADDRESS
NAVAL SUBMARINE LEAGUE
ANNUAL SYMPOSIUM
REMARKS BY
ADMIRAL CARLISLE A. H. TROST, USN(RET)
16 JUNE 2005

I am from Illinois, I am from down state Illinois, a little town called Columbia, a farming community, where I learned as a child that all the down state tax money goes to Chicago so those people can drive on concrete roads while we drive in dirt and dust. And that is something I will never forget. I should also note, that yes, there is a submarine named USS CHICAGO, a very fine ship, there is also a submarine named USS COLUMBIA. Now we don't name ships after towns of 5,000 population. But being in the right place at the right time can have benefits. Specifically, the Secretary of Navy at the time I am talking about was Will Ball. I was CNO and I got a package from NAVSEA for proposed ships names for new SSN's, I didn't like any of them. So I went next door and said "Will, we have a problem, I am going to send this package back but you ought to see it first. I don't like any of the names." He said, "What city would you like to name a ship after?" I said, "I would like to name one after my home town, but its obviously too small." He said, "Hell, I'm from Columbia, South Carolina, it's too small too, is there another Columbia?" I said, "Yeah, there's Columbia, MO." So we named the USS COLUMBIA after those 3 cities and people from all those cities participated in the launching and are supporting that ship today.

As to why we are really here, I'm here first of all to say "thank you" to the Submarine League for recognizing me as a Distinguished Submariner this evening. When I heard from Bruce DeMars that I was selected I thought it meant that everybody older and senior to me had died off, so it was my turn. He assured me that wasn't the case and I'll accept that. I also want to add my congratulations to those people who were the 2005 awardees today. I want to congratulate you because you epitomize what's the best of the Submarine Force and we are proud of you.

Those of you sitting in the immediate vicinity of the table I was at with Admiral DeMars, Admiral Reynolds and Dr. Stanford could have

heard a little hub-bub back there, and it was about how long I am going to speak. It ranged from Pauline's 4 minutes to any time you want. I like the latter, so I am going to take off my watch and put it in front of me. Now Pauline is going to think, "Aha, he got the message." You're going to think I am speaking for a finite period of time but I may or may not look at the watch.

I am going to do several things tonight. Initially, I had reveled in the thought, when asked to be the Distinguished Submariner, that I was going to have a nice free evening, a good dinner, be among friends and listen to someone who had something worthwhile to say. Then Bruce called me back and said "Oh, by the way we decided you're going to be the speaker". So that dream went out the window.

I am going to give you some thoughts on a few things that are on my mind; one of them being the proposed closure of the New London Submarine Base. I have heard from many of you on the topic, I have given my views to several, I'll give my views to all of you. It is one of the dumbest things I've ever heard. If one were interested in eliminating any aspect of our Naval posture, he would start by eliminating the Center of Excellence for that particular specialty. That is what New London represents to us, it is our historical home, but it is also the Center of Excellence. It is where we train officer and enlisted submariners in basic submarining. It's where we have all the schools for all the specialities that we require to support our Submarine Force. It is the heart of the system.

We can move schools; we've moved nuclear power school 3 times and it costs a lot of money. Sometimes we move for the wrong reasons. This time we are certainly talking about moving for the wrong reasons. I'm told Kings Bay is a big place and we can support things down there. In one of the briefings today we had an overhead view of Kings Bay; lo and behold, it hasn't changed a single bit since I was CNO and was down there quite frequently. There are still no piers there to support SSN's, no IMA facility to support SSN's, there is no master welder from EB ready to come up to the IMA, if it's still called that, to support the submarines that are there. So does it make sense, I think not. Should it be reversed, I think so. Would I speak out against this closure, I have and I would. I think it is a dumb idea. Guy Reynolds talked about being politically correct, I never have been noted for that particular trait. It is politically incorrect to say that

decisions made by responsible people are stupid, so I won't do that, although I think I did before. I'll just say that the people who proposed that closure to the BRAC committee are ill-advised.

I'd like to talk about a couple of other things, if the Submarine Force were a group of units and people who weren't needed for the future it might make sense to close New London and every other sub base. But we have a long and proud history of service to the country that proves the need. We recognize, in this room, people who were WWII submarine heroes. Who were part of that very brave group who carried the battle after Pearl Harbor to the enemy controlled areas of the Pacific, when they were the only forces available to do so. They performed well and honorably. One here this evening is Mike Rindskopf, my hero; because of Mike I learned the trade at Submarine School. This guy was known as a walking TDC because he saw in his mind what the answer was the TDC was going to tell us neophytes. I think back on those people, and I think back on my career and what most of you have done. We've been part of the Cold War Submarine Force. For many years what we did and what we were about wasn't well known; we certainly didn't talk about it. It wasn't really until Blind Man's Bluff (which is at least 85% accurate—you figure out which 85%), brought to public attention a lot of what the Submarine Force was doing. We all know about the role of our strategic deterrent forces, Polaris, Poseidon, Trident, C4 and D5, and the role they play. I know of the importance of the Submarine Force as an aspect of our strength which led to the end of the Cold War.

Many of you have heard me talk about the visit of Marshal Akhromeyev in 1987. Marshal Akhromeyev was the senior officer in the military of the Soviet Union. He was a hero in the Soviet Army in World War II. He was a dyed-in-the-wool supporter of the Soviet Union and it's aims. He came to this country in 1987 for a one week visit as a guest of Admiral Bill Crowe, a submariner who was our Chairman of the Joint Chiefs of Staff. Marshall Akamayov, at the outside of his visit, was invited to visit with the Joint Chiefs in the tank, the briefing room that we used, and he had asked to give his position on the Cold War and why the Soviet Union had the posture it had vis a vis the United States. We were the avowed enemy. He started off with a briefing chart, probably a meter in diameter, of the Soviet Union. Mother Russia was right in the middle surrounded by the

enemy. The enemy was represented by symbols. In the Mediterranean, the Atlantic and the North Sea around the Barents there were US SSBN symbols; land based symbols in Europe, all pointed at Mother Russia. Then he said "Here are your P3's, there were P3 symbols all over the place, that is how I know where my submarines are." Then he said, "I don't know where your submarines are, because we cannot detect them," then he pointed to me, sitting about 6 feet away saying, "you and your damn submarines are the problem. You're the problem to peace." Well, I took that with a smile. That evening Pauline and I went to Admiral Bill Crowe's quarters to a reception for Marshal Akhromeyev. He was standing next to the host as I came in. As I greeted him, I was wearing my blues, he thumped me again right on my dolphins and said "You're the problem". I was very proud of that and we should all be very proud of that.

What all of that says is we were doing our jobs. We were doing it extremely well and we were an instrumental group in bringing about the demise of the Soviet Union as the world's other major military power. It's something we shouldn't forget and we shouldn't let people forget the role that today's submarines play.

I've heard all the arguments: Some say submarines are too expensive. You're damn right they are. When we decide we are going to maintain two building yards, which I have no problem with, and we are going to build one submarine a year, that submarine is going to be expensive because you're carrying the overhead for a major portion of Newport News and all of EB. So, it's expensive. What's the product? The product is the Virginia class, which is starting to come in, the SSN 21s which are doing superbly, and JIMMY CARTER, just introduced to the fleet. I agree with Guy Reynolds, it is the finest submarine and the most complex submarine ever built. More importantly, going back for a minute to New London. New London sits just up the river from Electric Boat. One of our two major submarine builders, which is still the prime submarine design agency in the world. Do we want to give up the synergy that exists there and with Newport News as the second builders of submarines. I think not, I don't think the country can afford it.

I have a lot of thoughts on where we should go and what we should do, they are of a length greater than I want to talk tonight. What I want to talk a little bit about is Distinguished Submariners. We have

recognized Distinguished Submariners in this forum for a number of years. And they are indeed people who have distinguished themselves in the service of submarines, in the service of our country and the Navy. To me, anybody who goes to sea in a submarine, or has gone to sea in a submarine is a Distinguished Submariner. I really mean that about all of you. I would also add to that category the wives and sweethearts who support us.

Now I want to shift gears for a minute and talk about the Submarine Force. I had a civilian friend approach me after SAN FRANCISCO hit that sea mountain or the bottom. Whatever it was, it was almost disastrous. It was certainly destructive, causing the death of a young man. It was an event that was saved by a very trained and dedicated and hard working crew. That they brought that ship back to Guam to me is an absolute miracle. But they epitomize what we have come to expect of our submariners. This gentleman said "You know, I read about this SAN FRANCISCO thing and I saw pictures of the damage and by God you people in submarines must be crazy." I said "Yes, in a sense we are," I said "You know, we take out perfectly good ships and we sink them intentionally. But we have enough confidence in the people who build them, the people who maintain them and our very well trained and dedicated crews and in our ability to combat any casualty that we feel that whenever we want to come up we'll come up. If we didn't have that philosophy we would be crazy." I said, I recall when I got to basic submarine school they gave us a battery of psychiatric tests, I believe they were called. They were silly things where you look at charts and tell people what you see and the guy says, "Oh you didn't see that, you're thinking about something else." But at the time, all of us neophytes about to be submariners said to ourselves, gee, they are looking for people who are completely normal. Well, I learned subsequently, that there is nothing normal about going to sea, sinking a ship, and living in a steel tube with a bunch of people for extended periods of time under conditions that most of us wouldn't tolerate in our homes. I accept that we are all abnormal, that we are all shipmates and know that the epitomy of being shipmates really is, trust in your fellow crewman, trust in your shipmate. That is why, to me, you guys are all Distinguished Submariners.

One other thing I'd like to do is pay tribute to a few people. You ask yourself when you are selected for an honor like this, how did I get

here? Well, I worked, I was proud to be a submariner, but I thought back on it. My introduction to the Submarine Force was as a first class midshipman when, now retired Vice Admiral Lando Zech, was my company officer at the Naval Academy. Lando was a submariner, he was a dedicated professional, he inspired all of us with his honesty and his integrity and he was a true submariner. I think directly as a result of his being the walking, talking epitomy of leadership by example, half of the 39 of us who graduated in my company that year went into submarines. That's influence, that is influence by being positive. Lando and I have been lifelong friends ever since, and I treasure that friendship because he was a mentor for many years.

My first and third submarine CO's, my first two submarines, was one guy, retired Vice Admiral Shannon Cramer. Shannon's the guy who qualified me in submarines; he taught me the real value of leadership. When you worked for Shannon, you didn't work to satisfy yourself, you worked to not let the skipper down. That, to me, was an interesting example, his comment used to be, *fortune favors the bold*, what does that mean? The first time I surfaced the ship out in the Virginia capes op areas at the end of the week, he said I want you to give two orders, the first order is to answer bells on 4 engines and the next order is all ahead full. And you better be headed for home and we did that religiously. We never had a failure of any one of those 4 diesels in SIRAGO, they ran like jewels all the time and we headed home. We had one problem in that run to the base. The CO of SEA LEOPARD was named Bob Long, a classmate from the Naval Academy of Shannon Cramer, and they were competitors. They were both thorough professionals. Bob Long ended up being my at-sea qualifications officer, so I had even greater respect for him eventually. However, I learned that when we were out there operating together the goal was to beat Bob Long into port so that we got a choice berth. And when you didn't, you didn't do very well as far as Shannon Cramer was concerned. Bob Long was accused by many of us, God bless his soul—he died a few years ago, of using subterfuge. They had a third classmate who was the Operations Officer of Squadron Six. Bob used to arrange with this guy for a certain berth at a certain time, which he knew he couldn't make but he had that berth reserve; it wasn't kosher, but he did it. That used to really tick Shannon off. We came in one time that I had the deck, and as I was making my left turn into the pier,

we were told we were going to moor outboard of SEA LEOPARD, not alongside the pier. This was not because he had beaten us in, he was behind us and he was given the berth assignment from behind us to pass us and go in there first. Well, the fuming skipper said, "I've got the deck." His next command was "ahead full", and I said "Captain, we've got four engines on the line" He said "Ahead full Goddammit" and we charged in and then he said "all back full" and left the bridge. When I looked again, he was down on the forward deck and number one line went over. I got the ship stopped, his "back full" did help. He leaped across about 6 feet of open water onto the deck of SEA LEOPARD shaking his head saying, "Goddammit Bob, you did it again." That to me instilled the fun in submarines, it made life worthwhile. And finally, I would have to say I consider both of those gentleman Distinguished Submariners.

And if I looked at the third big influence, of which I have lots of memories, it was the *acquaintanceship*, and I use that word, with Admiral Rickover, which many of you have had. My first observation of Admiral Rickover was my first interview. I was a JG, I was Qualified in Submarines, I had 18 months aboard SIRAGO, and it was an event to remember. Pauline's parents lived in the Washington area so she came up with me when I came for my interview. I went over to the Old Navy Building, and like all of us, I had no idea of what to expect. We had all the preliminary interviews with the Rickover henchmen who found out everything about us they possibly could and I'm sure they told him everything about it before we ever got in there, and as a matter of fact, that was obvious. I was once asked if he did really have that chair with the sawed off front legs. I can tell you I didn't focus on that one bit, if he did I didn't notice it. It was totally out of my league. He started off with "Why didn't you do better at the Naval Academy?" I said "Well, Admiral I studied as hard as I felt I had to." "You could have done better." He then said "What else did you do?" "Well I sailed, I played soccer, I played tennis" "Why did you do that? What is the value of that?" I said "Well the idea of the Naval Academy is to make people well rounded." "Doesn't help you one bit." he said, "You should have been reading books." I said "I did read books" he said "tell me which ones you read." well I drew a total blank, so I said "believe me Admiral, I've read a lot of books." So about that time he said, "I guess you think your pretty smart." I said,

"No, not especially" "I'll bet you think you stood higher than I did at the Naval Academy." I thought about that for a minute and thought well you sure as hell didn't beat me so I said, "Yes sir." He said "Get out of here" and I left. After cooling my heels for another 3 or 4 hours we were finally dismissed. I went home that evening, about 7:00 p.m. I sat down to dinner with Pauline and her parents and said "We are going home tomorrow as soon as I check in and they kick me out because I didn't make it." I went in the next day and sat there until about 1600 on Saturday when they finally told us who had and had not made it, and I was selected to my astonishment. That was my start with Admiral Rickover.

Then I listened to Shannon Cramer as PCO of SWORDFISH deal with Admiral Rickover. We were on a living barge while the ship was still being built. He got phone calls from Admiral Rickover, sometimes he took them, sometimes he didn't. I thought, gee, this is kind of odd, we don't do that. One day, the yeoman said, "Captain, Admiral Rickover is on the phone." The Captain picked up the phone and all of a sudden he slammed it down. I thought, gee, he must have been disconnected. The phone rang again 30 seconds later. The yeoman said, "Admiral Rickover is on the phone, he doesn't want you to hang up." So Shannon picked up the phone and I heard him say, "Yes sir, Yes sir, and if you talk to me like that again Admiral, I'll hang up again." I thought, well there is a way of getting along with the good Admiral, but I didn't have the guts or stature to try it.

Later on, I went to PCO school, his 13 week PCO course, which was very, very valuable, very worthwhile before going to command of the SAM RAYBURN. As luck would have it, I had two XO tours because I had to learn how to do it. Then I went to Washington for three years. When I reported in to be PCO of the SAM RAYBURN I suddenly found myself the senior PCO of the 13 Submarine PCO's in the shop at the time. Which meant whenever something went wrong or he had a lesson to transmit he would call me in and he would chew me out for whatever went wrong on whatever ship. Then he would say "Do you understand it?" If I said "Yes sir," he would say "Now you get those guys together and you tell them what I mean. They don't understand it when I am talking to them, you tell them what I mean." So I played that role for 13 weeks.

I also had an opportunity as one of the PCO's to go in with the

young guys getting interviewed, young college students and midshipmen. That was an experience in itself. Let me tell you of two particular incidents, one was a young man from Notre Dame, a senior who was going to graduate with two degrees. A degree in nuclear physics and a degree in reactor engineering. We walked in together and Rickover said to him "Do you know that I select some of the best candidates to serve here as engineers on my staff?" The young fellow said, "No sir, I didn't know that" He said "Well, I have selected you to be one of those engineers, that is quite a feather in your cap." The guy listened to him for a minute and said "No sir, I don't want to do that" I thought oops. Rickover said "What do you want to do?" He said, "Sir I want to be a submariner, I want to be a submarine officer." Rickover said, "Don't you understand the opportunity I'm offering you?" "Yes sir, I do, but I don't want it." He turns to me and said "Trost, take this kid out and talk some sense into him." So I went out with him and we were back on deck in 2 hours, I talked to the young fellow and I said "Are you really sure you want to turn this down because he may just not accept you for the program at all." he said "I'm willing to take my chances." We went over and over and over that, he said "I'm willing to take my chances," he said "What do you think I ought to do?" and then I made my first big mistake "I said, if I were you, I would stick to my guns." So we went back inside, the good Admiral said, "Trost did you talk to him?" I said "Yes sir, I talked to him" he turns to the kid and said "What did he say?" the response "He told me to stick to my guns." So we both got kicked out.

I found out it wasn't all death and determination. When I was promoted to Rear Admiral in Secretary Warner's office I was serving as his EA at the time. Pauline pinned on one of my shoulder boards and Admiral Rickover came over and pinned on the other one. I figured, I have arrived, and our relationship from that point on was much better. Those are just some of the reminiscences I wanted to share with you, I want you to know that I am honored to have been selected for this particular honor this evening, I'm proud to be a submariner and I salute you all. God Bless You.■

SUBPAC CHANGE OF COMMAND

ADMIRAL WALTER F. DORAN, USN
COMMANDER, U.S. PACIFIC FLEET
COMSUBPAC
Change of Command
20 April 2005

Thank you very much for the kind introduction.

Ladies and Gentlemen, honored guests, fellow Flag Officers good afternoon, and Aloha!

Thank you all for being here. We are honored that you are able to join us for this important event. Your presence is certainly a great tribute to Paul and Anne Sullivan and a fitting welcome to Jeff and Teri Cassias.

Today has truly been a memorable day for the Sullivans beginning with the wonderful retirement ceremony this morning. This is also a wonderful time of year; the boys of summer are back playing baseball—and we find ourselves here in Hawaii to celebrate this Change of Command.

As you review Paul Sullivan's biography in your program he credits his grandfather Charles McCullough with giving him his love and hate of the Boston Red Sox. Well, this is the year—first championship since 1918.

This is a wonderful time of the year also for us few Oriole fans. We have about four weeks before mathematical elimination. Well today as we effect this change of command—the Orioles and the Red Sox meet for the first time this season and the first pitch was about fifteen minutes ago.

Shane and Megan, I assume that, like your parents, you are also Red Sox fans since that is generally an affliction passed down through the generations! So today hope soars from all of us— wanting; hoping to beat the dreaded Yankees in October.

Before I start, let me take a minute to thank the men and women of the PACFLT Band. Nothing sets the tone for an event like good music…and as usual, you guys sound great!

Also to our outstanding Color Guard who support events throughout the region and always give a positive impression of our

men and women in uniform. Thank you very much for your support once again.

I am thrilled to be here and to speak to all of you today; and I am excited for a few reasons. First, I am always happy to get out of the office and spend some time here on the waterfront. Secondly, it is always an honor to participate in the long-standing Naval tradition of formally transferring the authority and responsibility of command from one Commander to another. And finally, it is a personal privilege for me to preside over a change of command ceremony between two men whom I hold in such high regard.

These two men have been stalwarts of the Submarine Force for decades and contributed greatly to our preeminence in undersea warfare…they both also happened to command USS BIRMINGHAM during their distinguished careers, and I just want to say what a privilege it is for me to share the stage with most likely the greatest CO USS BIRMINGHAM ever had…we'll let them try to figure out who that is!

It was almost two years ago when I spoke at the ceremony where Admiral John Padgett turned command of the Pacific's Submarine Force over to Admiral Paul Sullivan. Since then, with the help of our coalition partners we have delivered democracy to Afghanistan, put the Al Qaeda terror network on the run, and offered freedom to the people of Iraq. It's amazing how the world has changed in such a short time. Yet there remains much to be done in this Global War on Terror, and I assure you that our Pacific Submarine Force will be critical to our victory, just as they were in World War II and the Cold War.

The strength of our Submarine Force is also a critical stabilizer in the Western Pacific, and the vital nature of that role should not be understated considering the state of the world today. In this age of globalization, the prosperity of the world depends very much on the security of the Pacific…Paul Sullivan understands that perfectly, because as the Commander of the Pacific Submarine Force he has been a critical piece of that security for the last 20 months.

We don't have the time to go into all of the accomplishments of SUBPAC under the leadership of Admiral Sullivan, but I'd like to touch upon some of the highlights.

For the past 20 months, through a very trying time in world history, Admiral Paul Sullivan has commanded the Pacific Submarine Force,

Task Force 134, and Task Force 12...and he has done so superbly.

As Commander Task Force 134, he guided the Pacific SSBN Force to unprecedented success under some of the most demanding and dynamic operational circumstances in recent decades. The seven SSBNs under COMSUBPAC's cognizance successfully completed twenty-six strategic deterrent patrols with nearly 100% system readiness.

This was accomplished while undergoing significant realignment in maintenance infrastructure; transferring two SSBNs to naval shipyards for conversion to SSGNs; transferring one SSBN to the Pacific from the Atlantic Fleet; and transferring one SSBN to the naval shipyard for refueling overhaul and backfit to Trident II missile capability.

Admiral Sullivan also oversaw the standup of the Pacific Missile range and successfully completed the first ever Trident II (D-5) launch in the Pacific as part of STRATCOM's Follow-on Commander's Evaluation Test.

As Commander Task Force 12, he implemented sweeping changes in Anti-Submarine Warfare operations in the Pacific Fleet, including integrating the networked capabilities of ASW assets under the Theater Undersea Warfare Commander and providing Submarine Force support for the newly formed Fleet ASW Command.

During his exceptional tour as the SUBPAC Commander, RADM Sullivan oversaw the first ever-expeditionary Strike Group (ESG) and Advanced Seal Delivery System (ASDS) submarine deployments, ushering in a new era in submarine warfare.

Paul Sullivan has done everything he can to improve the Navy he serves in, but his efforts were not only focused on today, his vision has helped define our Submarine Force for tomorrow.

His legacy will be felt throughout the Pacific Fleet and indeed throughout our entire Navy.

Paul Sullivan has improved the lives of the Sailors who work for him and improved the Navy that he serves in...and in doing so he has earned the respect of all he has encountered here in the Pacific.

While Paul has been the one accountable for all of the programs and initiatives I have mentioned, he would be the first to tell you that the credit for these many successes belongs to the outstanding men and women who make up the Pacific Submarine Force—but leadership

does matter and Paul you have excelled.

Earlier this year when USS SAN FRANCISCO suffered a traumatic grounding in the Western Pacific, we were all exceptionally fortunate to have had you at the helm of the Pacific Submarine Force.

You have proven to be a great warrior, leader, and diplomat throughout your tour as the Commander of the Pacific Submarine Force and indeed throughout your entire distinguished career.

By his side throughout that career was another outstanding leader who has done so much for our Navy family—Anne Sullivan.

Here in Hawaii, Anne has been a visible force in fostering friendship and cooperation between the community and Navy family members and her initiative in hosting a wide variety of spouse events has strengthened relations here in Hawaii and in fact throughout the Pacific. Her work particularly in the Submarine Community and in support of the Dolphin Scholarship Auction has been noteworthy.

If you know Anne, I think you realize that I could go on for quite awhile speaking about her many, many accomplishments. The Superior Public Service Award presented to her this morning was really only a small token of our appreciation considering her devotion over a lifetime.

Anne, Ginny and I would like to thank you for all that you did during this tour in support of our Sailors, their families and the local community. . .your efforts are genuinely appreciated.

Although this is officially a Change of Command, it is also a recognition of service. Throughout Paul's career you have both been great shipmates to all who came in contact with you.

Paul and Anne – on behalf of the entire Pacific Fleet, thank you and congratulations on a job extremely well done.

There are two men, two couples involved in today's transition. And while we have the difficult task of bidding farewell to Paul and Anne Sullivan, we have the much easier job of welcoming Jeff and Teri Cassias back to Hawaii. . .and I'll bet they feel like they got to Hawaii not a moment too soon.

Jeff, as pleased as you are to be here, we are equally pleased to have you back in the Pacific. You're certainly no stranger to SUBPAC having served three tours here previously...so welcome back to paradise ... *Aloha.*

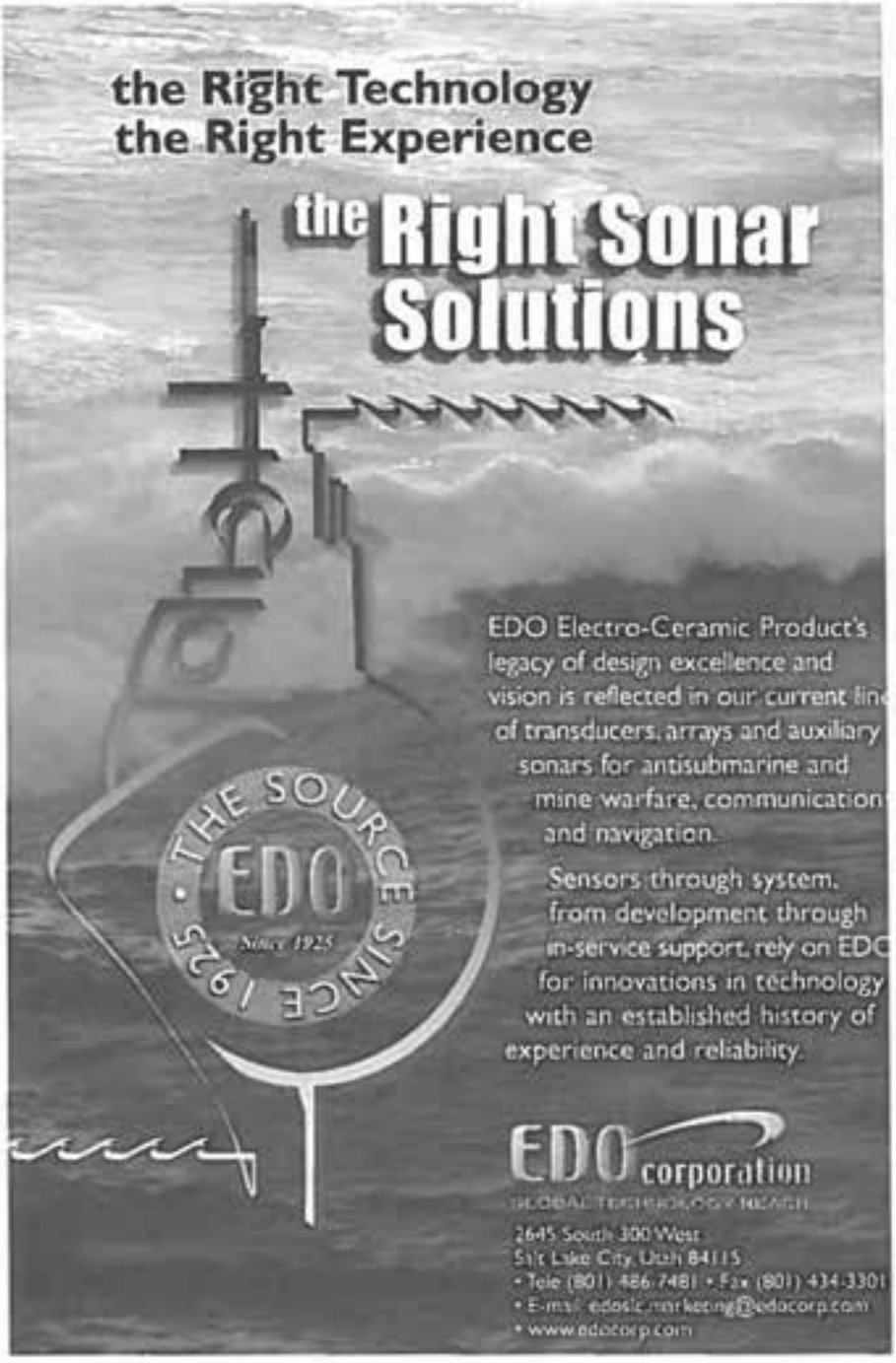
Having commanded CTF-73 in Singapore and having served a

significant portion of your career in the Pacific your knowledge of the region and the people involved will prove invaluable.

The Navy has done a smart thing, made a wise decision in utilizing your experience, background and training to lead SUBPAC into the future. . .and while the issues and challenges you'll face as SUBPAC Commander will be large—the rewards will be even greater.

I look forward to working with you, and I know that you are the right man to guide this command and community. There will be challenges in the future—perhaps great challenges—but I have the utmost confidence in your ability to lead the Pacific Submarine Force through it all.

Ladies and gentlemen thank you for being part of our proud Navy tradition. God Bless each of you, our Sailors and our families...and God Bless America.■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REAR ADMIRAL PAUL SULLIVAN
COMMANDER
SUBMARINE FORCE PACIFIC
SUBPAC CHANGE OF COMMAND
APRIL 19, 2005

Thank you, Admiral Doran for your kind words. They mean a great deal coming from a Naval Officer of your stature whom I so greatly admire and respect.

Earlier today in a retirement ceremony Admiral Donald honored me with talking about the last 35 years of my life spent in the Submarine Force, years that have been tremendously fulfilling. He and I also recognized the contributions of my family—Anne, Meghan and Shane. It gave me great pride to see my wife of 34 years and my friend of nearly 50 years, receiving the Navy's Superior Public Service Award in recognition for all that she has done to serve this organization and our Nation. I love you, Anne, for just being you.

To Lieutenant Shane, my son and my favorite Hornet Pilot, you honored me by following in my footsteps in service to our nation. You are a patriot who is both the future of our Navy as well as our family.

To Meg, who will always be my little girl even with two boys of her own, Will and Jack to raise—you have made and will always make your mother and me proud to be your parents.

It's particularly poignant to be standing here—on PASADENA moored at SUBASE Pearl Harbor's Pier Sierra 9—the same mooring at which I was first introduced to SUBASE Pearl Harbor way back in 1971. I was returning from my first WESTPAC aboard CAIMAN (SS-323). The 'Flamin CAIMAN', as she was called, was on her way home to San Diego after a successful 7-½ month deployment. As a brand new Submariner, I had flown to the Philippines four months earlier to join her crew in mid-deployment.

I remember this experience like it had occurred only yesterday. My MAC flight from California seemed to take *forever* as it flew westward towards Clarke Air Force Base, briefly stopping only for fuel in Honolulu and Guam. Sitting crammed among other servicemen, many heading off to war in Vietnam, aboard that 707 aircraft, my mind was racing with both thoughts of joy as well as apprehension.

Joy of actually beginning my career of service to the nation as a Naval Officer—something I had dreamed of doing since I was a young boy. Apprehension with the thought of being the *George* in a Submarine Wardroom (You known the expression -'let George do it'). As a rookie Ensign, I kept wondering would I be accepted by a crew that was at the top of their game in mid-deployment? Would I earn their respect as a fledging leader and mariner?

My arrival on board CAIMAN—what a whirlwind of new experiences! From the moment I stepped aboard I was treated as a full-up member of the crew and wardroom. Laying below decks as the crew manned stations for the maneuvering watch, I was directed to the Wardroom to share a cup of coffee with my new Captain and Exec. (Back then, I didn't even drink coffee—but I did that day!) They made me feel immediately at ease and told me we were about to sail south to Singapore. The Exec mentioned that they had delayed the underway awaiting my arrival. 'They waited for me? Wow...amazing!'
The Captain then stated—"I know you must be tired from the trans-Pacific flight, but I'd still like you to go to the Bridge and conn our boat to sea."

I couldn't believe it! My response was—"Aye, aye Sir!" I jumped up to head aft to the Control Room and up to the Bridge. The XO yelled out after me, "Paul, you might want to change into your uniform first!" ...Oh yeah, I knew that...

I got to the Bridge (in my uniform) and met the OOD, LT Davey Robinson, a seasoned dolphin-wearing vet a year older than me. He told me the ship was ready in all respects to get underway, just awaiting the CO's permission to take in lines. He asked me if I was ready to take the Conn? Are you kidding me? I thought. I was born ready for this moment and responded for the first time as a Naval Officer - "I'm ready to relieve you, Sir."

As we started taking in lines, I suddenly realized, I had never looked at the chart and hadn't a clue about the outbound track. I sheepishly asked Davey—"Which way out?" With a funny smile, Davey put the chart in my hands and pointed out past Subic Bay's Grande Island towards the South China Sea and said so only I could hear it—"That-a-way, first course 270". I had just begun to understand that submarining was truly all about teamwork and forceful back up.

Following the maneuvering watch, the Exec asked me to check rig

for dive in the Forward Torpedo Room and Forward Battery, which I did. Next, I was sent to the Control Room to be the Diving Officer for the boat's initial trim dive. After submerging and then surfacing successfully, I was finally shown my accommodations—a rack in the forward Torpedo Room nestled among huge MK 14 torpedoes. I instantly hit the rack and slept like a baby, or more appropriately, a seasoned submariner.

I couldn't believe it. In the span of 3 hours, I had nearly done it all as a submariner. My apprehensions had quickly faded away and I knew all my dreams of being a Naval Officer would come true. For the first time, I felt I had been accepted by the unique *Band of Brothers* known as the Submarine Force.

It wasn't until many years later, as a CO myself, that I finally realized this was more a test of my mettle as an officer vice a welcome aboard exercise. In either case, it sure worked for me!

Why did I relate this old sea story today? Well, I wanted to describe the Submarine Force I had joined in 1971… and I truly believe it's not much different than the Submarine Force of 2005. We still give people big responsibilities, even at a very young age, and they give back by performing in ways that are spectacular.

As I think back to that time on CAIMAN and first mooring here at Sierra-9, I marvel at how much has changed. Richard Nixon was President. Our Nation was fighting in Vietnam. Student protests against the war in particular, and authority in general, were underway across our land. A gallon of gas cost 22 cents. IBM just invented the floppy disk. The keel of the Navy's newest submarine, PARCHE, had been just laid. Monday Night Football with Howard Cosell debuted on ABC. Serving your Nation in the military was definitely not considered very cool. And an Ensign in the U.S. Navy earned a mere $417.60 a month.

As a side note, I should point out that as a single Ensign that was the richest I ever felt in the Navy.

Indeed, the world is a vastly different place since those days. The Cold War ended. Our Navy as well as our Submarine Force have gotten much smaller, but at the same time vastly more capable. To me, submarine racks have gotten harder, and the ladders a bit longer.

During the Cold War, a submarine was primarily an anti-submarine warfare platform, focused on finding and sinking Soviet submarines,

primarily in the deep waters of the open ocean. We were the Navy's capital ship of that day—being the most lethal, effective and efficient ships in the Navy's inventory.

Today, submarines are multi-mission platforms, often operating in shallow littoral waters filled with shipping traffic—waters that present different acoustic conditions and constant, stressful challenges. Although today's SSNs are still concerned about maintaining their proficiency in anti-submarine and anti-ship warfare, they are also able to unleash powerful strikes ashore, to insert Special Operations Forces covertly onto hostile beaches, and to gather intelligence critical to our Nation's understanding of potential threats. The technology aboard our ships is just incredible. In my opinion we remain today the Navy's capital ship being the most lethal, effective and efficient ships in the Navy's inventory.

In our Strategic Submarine Force, represented very proudly by ALABAMA moored at Sierra -21, we have reduced our force to just 14 boats. But the fundamentals of how we operate those boats have not changed. The two-crew concept and our job of strategic deterrence remain the same, as has their ability to launch quickly and accurately from below the surface of the ocean. Today, nearly 70% of an SSBN's life is spent at sea, which is an amazing testament to their crews, and to the training and repair infrastructure that supports them. Our Tridents are without question the Nation's ultimate insurance policy.

Another area that has changed is that our Nation's focus has shifted from the Atlantic back to the Pacific. While during the Cold War we were equally concerned with a Soviet threat in both oceans, today we find the majority of the demand for submarines coming from this theater. At the same time, there has been a proliferation of submarines among other nations, tremendously complicating military operations.

Yet while so much in and around the Submarine Force has changed, there is one constant that stands above all others: our people. The people who operate submarines continue to be some of the best and brightest people our Nation has to offer. They are a group that carries on the proud legacy established by those daring men that served on submarines in World War II, and helped our Nation to win the Cold War. They are true Patriots in the service of the Nation.

The Navy is a legacy of Sailors. When people come into the Navy, they are trained by Sailors. When they are in their training pipeline,

they are trained by Sailors. When they report to their first ship, there is an entire crew eager to train us—a crew of Sailors. We learn and we pass on seamanship, navigation, and engineering. We learn leadership. We move through tours and through the ranks, always learning more from our shipmates—Sailors.

It isn't long before we find ourselves teaching others—passing on to our shipmates what we have been taught, and improving it a little along the way. We continue learning, improving, and passing it on until the day we stand where I stand today... the day we're piped ashore.

In that sense we are part of a legacy. A legacy means that you learn from those who came before you, carry on their traditions of excellence, and then pass them to the next generation. As I leave the Navy today, I leave knowing that this force is in excellent hands, and I leave deeply honored to have been a part of this legacy.

My time as COMSUBPAC has been professionally and personally satisfying. It was nearly two years ago that I stood here, feeling the great anticipation and even a little anxiety as I prepared to lead the Pacific Submarine Force.

So much has happened in such a short time. We began converting four Trident submarines to SSGNs, and demonstrated the concept in the hugely successful Sea Trial Experiment—Silent Hammer. We decommissioned the last of the Cold War's Sturgeon Class submarines PARCHE after three decades of unrivaled service to our Nation. We put JIMMY CARTER into service, a boat that will soon join the Pacific Submarine Force and carry on that legacy. We brought into service VIRGINIA a submarine built to successfully operate in the post Cold War's challenging environment. And we made the first operational deployments of ASDS—Advanced SEAL Delivery System—aboard a Pacific SSN. We stood tall with the Crew of SAN FRANCISCO as they worked so hard to successfully save their boat and themselves.

All the while, we kept doing what we do so well: manning, equipping, maintaining and supporting the U.S. Navy's submarines in the Pacific. Our submarines have performed nearly flawlessly, carrying out numerous missions of vital national importance, never missing a beat. Our crews almost make it look too easy.

There have been so many changes in such a short time. Changes in

how we select, train and assign Commanding Officers, tactical proficiency standards, how we protect ourselves from terrorist threats, how we integrate with amphibious and carrier strike groups, and how we support special operations forces. In all these areas, this staff and this force have performed masterfully.

I want to say a special thank you to the SUBPAC staff, particularly to my Chief of Staff CAPT George Manaskie and his wife Sue, FORCE Master Chief BENKO, the N-Heads and front office staff who supported me most directly. This is a group that has such great enthusiasm, knowledge, and a true belief in our mission of supporting submarines in the Pacific. Thank you.

I also want to thank CAPT T.K. Hohl and the CTF-12 staff. This is a staff of anti-submarine warfare professionals that patiently and deliberately bring together information from all of our forces—including maritime patrol and reconnaissance assets, aircraft, SURTASS ships, and submarines—to keep track of what is going on under the surface of the Pacific in a way that is truly theater-wide. They have helped lead the resurgence in the Navy's ASW capabilities.

To our submarine crews here today, and to the Commanding Officers, Squadron and Group commanders: let me say that it has been the pinnacle of my professional career to be your Force Commander. You inspired me daily to support you. As you look to the challenges ahead, remember that challenges have always faced our Submarine Force. We got to be the best by recognizing, attacking and overcoming challenges with talented people, technical discipline, innovation, hard work and relentless tenacity.

Admiral Doran, I want to thank you for all that you have done for our Submarine Force, for our fleet and for our Navy. Nobody could ask for a better boss. You truly understand and appreciate us. After all, you have surrounded yourself with submariners up at Makalapa! You have ensured that our submarines are used operationally in a way that delivers the greatest return on investment for our Navy and our Nation.

To Admiral Cassias... Jeff - you and Teri are getting the best job in the Submarine Force, and perhaps the best in the Navy. It is a bittersweet moment for me, knowing that I am leaving SUBPAC, but knowing that I am leaving it in very capable hands. As a former fellow CO of BIRMINGHAM, I know you are up to the challenge. BIRMINGHAM was a very special boat. Over her 19-year history,

BIRMINGHAM's crews' had seven Commanding Officers—five of us became Flag Officers, four of which are here today (besides us—VADM (ret) Dennis Jones and RADM Mark Kenney). By the way, a bit of history, I believe this is the first time that COs of the same ship relieved each other as the Force Commander.

Whenever we BIRMINGHAM COs gather we always talk about how blessed we were to command such a fine warship and readily agree it was our crews, which made us look so good.

We always kid each other about who was the best CO and even make a point of querying crewmembers that served with several of us on who in their opinion was the best. In deference to Admirals Jones and Kenney, as COMSUBPAC, I decided that I get the 51% vote. And my vote is for Jeff Cassias. Jeff—you not only were the best, but also are the best. I feel so blessed to have you relieve me as COMSUBPAC, because I know you will make a great Submarine Force even better, just as you did with my first command, the good ship BIRMINGHAM.

Thank you all for making this a rewarding tour and a great adventure. As I prepare to go ashore onto SUBASE Pearl Harbor's Sierra-9, the emotions swirling through my head today are very similar to what I felt over three decades ago when I went aboard CAIMAN: This time I have no thoughts of apprehension, but only of joy. I'm overwhelmed at the responsibility I've had, and I'm deeply proud to be a part of such a great team. I am very honored that I was given such a wonderful opportunity to serve our Nation.

It has been a privilege to be COMSUBPAC, and to serve our Nation in the Band of Brothers known as Submariners. I'll end my remarks with an old submariner farewell to you all—"God speed and good hunting!"■

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ARTICLES

"UNLIKELY ALLIES: GREAT BRITAIN, FRANCE, THE U.S. AND JAPAN IN WWI"

by Mr. John Merrill

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Introduction

When World War I broke out in Europe on August 4,1914, Great Britain declared war against Germany. At first, the British assumed that Japan would remain neutral. However, several days later, Great Britain asked Japan for naval assistance against the Imperial German Fleet in the Pacific. Participation by Japan would be in compliance with a provision of the then current Anglo-Japanese Alliance. Two weeks after the start of the World War, on August 24, 1914, Japan's naval support of Great Britain began in the Pacific Ocean with a Japanese declaration of war against Germany.

The roots for Great Britain's request were established in a highly secret nine months period of negotiations in 1901-02 between these island maritime nations. The new Anglo-Japanese Alliance was officially accomplished January 30, 1902 with a public announcement in February. Prior to promulgation, the Alliance was shown to Washington (a silent partner). An Alliance benefit was that it would help maintain an *open door* to the Orient.[1]

One part of Japan's initial participation involved an almost immediate successful joint sea and land attack with Great Britain against the important German Yellow Sea port and naval base on leased land at Tsingtao on the Shantung Peninsula. The action ended on November 7, 1914. Other elements of Japan's naval advocacy during the following four years included assistance in the Pacific and Indian oceans. It is a bit surprising that in 1917-18, Japanese destroyers fought German and Austro-Hungarian submarines in the Mediterranean. Japan's support for the Allies came in other ways as well. In 1916, Japan delivered thirty-four trawlers to France. The following

year, in five months[2] Japanese shipyards built 12 *Kaba* class destroyers for France. This is the first example of a European power using Japanese industry on a large scale.[3]

Why did Great Britain enter into an Alliance with Japan?

This diplomatic move was a first in several respects. It was the first full-scale alliance with any nation by Great Britain in almost a century. In the new century, Great Britain found itself in financial straits as a result of the on going twenty-seven month war (1899-1902) with the Boers in South Africa and in the beginnings of a naval race with France and Germany. The primary naval powers placed emphasis on costly and manpower intensive capital ships (dreadnoughts). This focus placed a limit on the availability of cruisers and other naval ships that proved to be better suited to the type of naval warfare that evolved in the1914-18 war.

According to naval historian Arthur J. Marder, "... from 1901-02 Admiralty looked upon Germany as the potential enemy of the Royal Navy."[4] Further, France and particularly Russia were presumed to have designs on parts of the Far East critical to Great Britain's interests (northern India and China). A global British Empire and a sometimes-extended Royal Navy could use support from a country with a proficient navy and strong maritime interests.

The Japanese success in the Sino-Japanese War (1894-95), that was fought over supremacy in Korea, was a sound defeat for China on land and sea. Japan emerged as a major world power and gained Taiwan, and treaty rights in Manchuria and Korea. Gaining as an economic power, Japan looked for assurance in holding the gains made of that war. An alliance with Great Britain offered advantages.

A further alignment in diplomatic arrangements was the 1904 agreement between England and France that resolved their antagonisms and controversies but was not an alliance.[5]

The initial Anglo-Japanese Alliance allowed that in the event of Japan at war with Russia, Great Britain would remain neutral. Great Britain would intervene if a second power came to Russia's aid. Containment of Russian power and maintaining an "open door" policy for China trade were principal goals. The Russo-Japanese war followed shortly after the signing of the Alliance. The war required Russia to move a substantial part of its coal-burning fleet 20,000 miles

from the Baltic to the northern Pacific Ocean. The Alliance partnership precluded Russian ships from coaling ashore on the voyage from the Baltic.[6]

The Alliance was renewed, on August 12, 1905, just prior to Japan's victory over Russia and the signing of the peace at Portsmouth, New Hampshire. The Alliance deliberations at the renewal included participation by the Alliance partners in the event of a single power attack on one of the partners. Further, there was acknowledgement of Japan's interest in Korea. Discussion by the Alliance partners included consideration of appropriate action in the event of a probe by Russia into northwest India. By 1907, France, Russia, Japan and Great Britain shared common goals. In 1910, there was British support for Japan's goals in Manchuria. The same year Korea became a Japanese colony.

On July 13, 1911, the third Alliance treaty was signed in London. It renewed and extended the Alliance. At this point, the needs of the participants were divergent on some issues. One of Great Britain's foremost interests pertained to the security of the Pacific Ocean area dominions of Australia and New Zealand. There were policy differences regarding China. Japan looked for protection against the fear of isolation in the Pacific vis-à-vis the United States. This version of the alliance-excluded America from the nations that Britain would fight on Japan's side[7] and provided a basis for Japan's eventual war declaration three years later.

At a May 1911 British ministerial meeting in London prior to the ten-year Alliance extension with Japan, a hypothetical case of a discontinuance of the Alliance with Japan in 1914 was considered. Foreign Secretary Sir Edward Grey presented the following statement: "...in the interest of strategy, in the interest of naval expenditure, and in the interests of stability, it is essential that the Japanese Alliance be extended."* It appears prescient that the year 1914 was provided as an example.

Japan's disposition regarding the four-year war with Germany is clouded. At various points during the War, there seems to have been a reluctant willingness to participate. When participation did occur, it was effective and did help the Allied cause.

*Arthur J. Marder, *From the Dreadnought to Scapa Flow, The Royal Navy in the Fisher Era, The Road to War*, Vol. 1, Oxford University Press, London, 1961, p. 238.

In the years leading up to the war, diplomacy and treaty building were not the singular concern of nations with substantial navies. It was a period of rapidly changing and improving technology of the fighting ships including their construction, capability and weaponry. Further, advancement in the development, manufacture, and improvements in naval guns, mines, depth charges, submarines, and torpedoes provided additional challenges to the countries' naval tacticians and naval strategists. Technological advancements brought increased skill requirements for the men manning the ships and as previously mentioned, fiscal limitations were omnipresent. Many challenges were to be encountered and at the same time occasions occurred for errors to be made. It is pertinent to mention that the primarily coal-burning naval warships were a huge encumbrance for the navy planners, strategists, and tacticians at all times.

Pre-war British Naval Position

Great Britain concentrated its fleet in home waters, not for home islands protection but to prevent German cruisers from breaking out into the oceans and trade routes. This period also saw a reduction in the Royal Navy's Mediterranean and China squadrons and termination of the South Atlantic force. As early as 1905, the Admiralty slowly moved toward a policy of recalling the Mediterranean fleet in time of war, first under some contingencies and then under most.[8] Fiscal and naval manpower considerations helped foster the reductions. Manpower for the growing navies of the competing powers of Great Britain and Germany was also a priority. It happened that England maintained its navy with volunteers while Germany used conscription to fulfil its quotas. As mentioned above, the manpower sought now had an additional need: competence in technological areas.

Under these conditions, naval support for Great Britain around the globe came from good relations with the United States providing a naval backup in the western Atlantic as well as in the Pacific. France provided important naval coverage in the Mediterranean with the 1904 Entente mentioned above.[9]

Japan Enters the War

Japan quickly accepted the naval role of protecting Britain's interests in the Pacific as the War started. Initially, Japan's viewpoint

made it clear that the ground war was a European event and not in the sphere of interest for the Japanese Army. However, by February of 1916 a willingness to send troops to the West was stated. In some instances the expression *willing reluctance* may have been appropriate. The record shows that in addition to naval support for the Allied cause Japanese support included arms, industrial products, shipyards, and merchant ships.

"On August 15, Japan, acting with the advice and consent of Great Britain, sent an ultimatum to Germany demanding the immediate withdrawal of German warships from the Orient and surrender to Japan of the leased territory of Kiauchau (Shantung Peninsula).[10] With no response from Germany, Japan declared war on August 23. The remainder of the year saw Japanese naval action mainly in two different areas. One was (as previously mentioned) the immediate joint action with components of the British Navy in the siege at Tsingtao on the Yellow Sea. The other direct action was to take Germany's Pacific Micronesia islands. Before the end of the year both were successful.

Germany in the Pacific

Germany was well established on China's Shantung Peninsula. Sino-German commercial collaboration on the Shantung Peninsula and German acquisition for 99 years of Kiauchau, a 200-square mile area, dated from 1897. In the following years, Tsingtao, Germany's only fortified base in foreign waters, included a German-style city, industrial and maritime facilities, and substantial fortifications on the bay.

By 1914, German holdings in the Pacific also included the Mariana, Marshall, Caroline, New Guinea, Samoa, and Solomon Islands distributed on both sides of the equator and mostly west of the 170° longitude line.

At the time of Japan's declaration of war against Germany, the Shantung German industrial and military garrisoning was significant. Total troops numbered about 6,000, and naval support included an Austro-Hungarian armed cruiser, five gunboats and two destroyers.

Germany's East Asiatic Squadron under the leadership of Vice Admiral Maximilian Graf von Spee, equipped with the new armored cruisers *Scharnhorst* and *Gneisenau* plus three light cruisers, was the

challenge to the British in the Pacific. Normally based in Tsingtao, von Spee in a pre-war move by July 17 removed his armored cruisers from the Shantung region to the Caroline Islands. The Admiral's plan was to impact British trade routes by operating off the West Coast of South America with coaling capability at Chilean ports. Intelligence regarding the location of naval vessels of both sides in remote oceanic areas was frequently incorrect or not available.

Japan's late August entry in the war with a clear naval superiority in the Pacific motivated Admiral von Spee's disposition of his forces. This is exemplified in the light cruiser *Emden's* November 9 assignment to the Indian Ocean. After three months of successful encounters, the *Emden* was sunk off the Cocos Islands in the Indian Ocean by the Australian light cruiser *Sydney*. The *Emden's* successes during that period included sinking or capturing seventeen British merchant ships of 68,000 tons in the North Pacific and Indian Oceans. During these early months of the war, Germany's East Asiatic Squadron was gradually decimated.

In addition to sinking and capturing ships of British registry, two significant open sea battles occurred in the next several months. These battles have been noted as the last open sea battles of the 20th Century fought without sea mines, submarines and airplanes. The first was the clash between mostly light and heavy German and British cruisers off Coronel on the coast of Chile on November 1, 1914. This was a decided victory for the Germans. Two of the four participating British men-of-war were lost with no German ship losses. This was the first naval battle loss by the British in one hundred years.

On December 8, a second sea battle of armed cruisers occurred in the South Atlantic at the Falkland Islands with the *Dresden* escaping and the other six German ships sunk. Von Spee was lost with his flagship-armored cruiser *Scharnhorst*. His two sons were also lost in the battle. Even with a much-reduced German cruiser capability in the Pacific and Indian Oceans, there was a contributing naval role for Japan throughout the war.

Tsingtao

Prior to an August 23 declaration of war against Germany and with China in a neutral status, Japan with a strong interest in the German holdings on the Shantung Peninsula, immediately authorized a

blockade of Tsingtao. The New York Times on August 17, 1914 headlined the beginnings of the assault with 16,000 Japanese troops embarking for the Yellow Sea stronghold and included a map of the area. The following three-month siege of the long-held and well-established German stronghold ended with the German surrender on November 7. Land and sea forces were primarily Japanese. Other Western Allied participation was minimal with British naval support and troops, South Wales Borderers and the 36th Sikhs from the Tientsin Hong Kong Garrison.

Twelve forts and barracks for 5000 troops protected Tsingtao and environs. It was considered the Kaiser's stronghold in the Far East and sometimes identified as the "German Gibraltar of the East."[11] At the time of the Japanese assault, several thousand additional support troops were added. The Japanese naval assault and landings with 60,000 troops, including British participation, began in early September. The extensive bombardment included both land and naval encounters. A German- Austro-Hungarian surrender occurred November 7.

Wakamiya Sea Plane Tender

A Japanese trading ship, *Wakamiya,* modified as a seaplane tender and equipped with 4 Farman floatplanes, entered service in 1913. During September at Tsingtao, *Wakamiya*'s seaplanes (with a speed of 60 mph and ceiling of 1500 feet) participated in a great number of sorties, dropped bombs, and provided observations. Pilots used visual communications with each other. Even with the limitations of the aircraft involved at that time, the value of aerial observation at sea and other capabilities of planes in naval warfare did not go unnoticed.

German Pacific Islands

Historians, considering Japan's objectives as an ally, identify taking possession of the German holding in China's Shantung region and the various German Micronesian islands as a primary goal. The successful siege of Tsingtao was consummated with the German surrender on November 7, 1914. Almost immediately (January 18, 1915) Japan submitted 21 demands to China regarding Japanese claims. The Sino-Japanese treaty of May 25, 1915, allowed Japan

rights in southern Manchuria, eastern Inner Mongolia and Germany's economic holdings on the Shantung Peninsula.

Even more quickly within two weeks of declaring war against Germany, German colonial possessions north of the equator in the Pacific surrendered to Japan. The Marianas, Caroline Islands (East), Caroline Islands (West), and the Marshall Islands were captured and occupied by the Japanese on about October 6, 1914. Resolution of Japanese long-term entitlement to these islands and clarification of eventually returning the Shantung region to China were resolved at the 1919 Peace Conference.

Japanese Naval Role 1915-1916

Immediate opportunities for Japanese naval support included assisting in the search for Germany's remaining battle cruisers in the Pacific and Indian Oceans. Japan also provided convoy assistance to the vast movement of Australian and New Zealand troops and war materials across the Indian Ocean. With a reduced British naval presence, especially in the north Pacific, as well as a lessening of German capability, Japan's naval presence became significant. Japan's occupation of the northern German Micronesian islands also caused concern and discomfiture with the British dominions of Australia and New Zealand. This concern presented itself later at the peace negotiations in France.

Singapore Indian Troop Mutiny 1915

January and February of 1915 saw unrest within the Indian Army in India and abroad. Planned army uprisings in January 1915 at Rangoon, Burma and February at Lahore, India were aborted. At Singapore February 15, the 5th Light Infantry Battalion of 800 (all Punjabi Muslims), plus 100 members of the Malay States Guides Mule Battery mutinied.

Causes for the mutiny included the prospect of the Muslim battalion being assigned to fight Muslim Turkey. Later examination of the motivation for mutiny included poor leadership, inadequate rations, and poor NCO promotion prospects. Pan-Muslim feelings were also considered to have contributed to the mutiny.[12]

On Singapore Island, there were 231 regular European troops. Thirty-two British soldiers and civilians were killed. German prisoners

were released, a few fled. Within ten days the insurrection was subdued, the support coming from marines and crews from British, French, Russian and Japanese warships in port. Several hundred civilians also were involved in the suppression of the mutiny. On February 17, two protected Japanese cruisers *Tsushima* and *Otowa* landed marines in the action. It has been mentioned that about 100 Japanese marines and sailors came ashore to assist.[13]

Mediterranean Submarine Warfare 1917-18

By the middle of April 1917, the adversaries within the confines of the Mediterranean in the anti-submarine war included Great Britain, Italy and France aligned against Germany and Austria-Hungry. Italy, neutral since August 3, 1914 gave up its neutral status and declared war against Austria-Hungry in 1915 and Germany in August 1916.

Germany's late 1916 reinstitution of unrestricted submarine warfare proved to be highly successful as the new-year opened. With a total of 150 U-boats engaged in unrestricted warfare, the February and March 1917 total overall tonnage lost to the U-boats was on track for an Allied disaster by fall of that year. Further, the exchange ratio of the number of Allied ships sunk to the number of submarines lost reached 167 per U-boat by April, a fivefold increase from the February exchange ratio of 53 per U-boat. Overall, 25 % of the total British shipping loss during the War from mines and submarines occurred in the Mediterranean. Seven percent of the total sinkings of the War took place in April 1917.[14]

In spite of historical evidence favorable to convoying ships, the Allies in World War I waited nearly three years until April 1917 to invoke convoy as a way to effectively curb the very successful U-boat sinking of merchant ships. It was under these near-crisis loses from the U-boats that Great Britain requested Japan's naval support in the Mediterranean. More than one request was required to have a Japanese naval presence in the European Theater. Japan surmised that sending a fleet would leave the Pacific open to expansion of American naval power.[15]

The United States as a recent entrant into the war did not have a presence in the Mediterranean until 1918. By then, with the war winding down, there were thirty-six United States newly constructed

110-foot wooden submarine chasers operating out of Corfu and an additional 18 assigned at Gibraltar.

Japanese Naval Presence in the Mediterranean 1917-18

On February 16, 1917, Great Britain advised Japan that in a post war environment, it would agree to Japan's claims to German rights in Shantung and possessions in the islands, of the Marshall, Caroline and Marianas Archipelagos, north of the equator. Australian rights to the German areas south of the equator were part of the agreement. This secret agreement also had assurance from the Russian, French, and Italian governments. Perhaps this agreement ended Japan's slow and reluctant response to Great Britain's request for help in the Mediterranean. At the 1919 Peace Conference at Versailles, this concession was granted with the exception that the date and conditions for the return of the Shantung area to China was not specified.

Mid-April 1917, a Japanese Mediterranean squadron of destroyers began to assemble at Malta to assist the Allied fighting against the German and Austro-Hungarian U-boats. The Japanese destroyers, initially 12, with cruiser flagships were an important part of the anti-submarine convoy escort.[15] Destroyers were needed to hunt submarines or provide escort for the now heavily invoked convoy system. Marder's comment regarding destroyer performance in the Mediterranean points out the efficiency of the dozen Japanese destroyers. [17]

Destroyers: Time at Sea

Japan	British	French/Italian
72%	60%	~45%

In June 1917, in recognition of the Japanese ship handling skills, the British transferred to Japan for duration the *Acorn* (H) class destroyers *HMS Nemesis (Kanran) and HMS Minstrel (Sendan).* The ships were returned in 1919. This brought the number of Japanese destroyers in the Mediterranean to fourteen. Marder in From the Dreadnaught to Scapa Flow points out the seriousness of some of Japan's destroyer captains, "So impregnated with a sense of duty that

some of their destroyer captains committed hara-kiri when a U-boat sank a ship they were escorting!"[18]

May 3, 1917

On this date, the British troopship *Transylvania,* an ex-Cunard ship, departed Marseilles bound for Alexandria with about 200 officers and 2,860 troops. The Japanese destroyers *Matsu* and *Sakaki* escorted the ship. On the following day in the Gulf of Genoa, the German submarine U-63 torpedoed the Transylvania.

During passenger offloading to the *Matsu,* the *Sakaki* attempted to force the U-boat to remain submerged. A second torpedo from the U-63 caused the *Transylvania* to sink more rapidly. One of the destroyers saved 1,000 of the survivors. Other vessels came to assistance, but most of the survivors were aboard the Japanese ships. In all, 414 passengers lost their lives.[19] Later the *New York Times* reported that during the rescue effort, a second torpedo struck and "blew the ship sky high."[20]

June 11, 1917

"Japanese Destroyer Damaged, while Japanese destroyers were attacking a submarine in the Mediterranean on June 11, the destroyer *Sakaki* was torpedoed and damaged, says an official announcement of the Japanese Admiralty June 15. The damaged craft was towed to port. The Japanese Naval attaché in London announced the loss of 55 lives aboard the *Sakaki.* –N.Y. Herald, 17,6."[21]

Other references identify the source of the torpedoing that destroyed the bow of the *Sakaki* with a loss of 68 of the 92-person crew as the German designed Austrian submarine U-27. The destroyer was on escort duty off Crete in the eastern Mediterranean. The destroyer was salvaged and repaired. Shortly after this incident the U-27, a 121-foot submarine with a crew of 30 at sea for 90 days, traveled 4200 miles on the surface and 70 miles submerged in the eastern Mediterranean and evaded, attacked, and sank a number of ships.

To help place the scale of Japanese participation in perspective, by early 1917 Allied vessels against submarines in the Mediterranean included 147 destroyers, 75 torpedo boats, 200 trawlers, 68 submarines, 78 sloops, gunboats and other craft.[22]

Halpern in *Naval War in the Mediterranean* (1987) noted Japanese destroyer support: "The Japanese were largely responsible for escorting troopships, in fact the postwar study by the Mediterranean Staff concluded that without the assistance of the Japanese forces 'the situation would have been impossible'."[23]

United States and Japan Relationship

Japan's naval role of assisting Great Britain was extended to the United States with President Wilson's declaration of war in April of 1917. Throughout the war an attitude of suspicion towards Japan and its goals was held by some in United States and Great Britain. With exceptions, an air of diffidence seems to have been detected in many quarters of the governments when dealing with Japan. The incident of the Zimmerman Telegram and the United States policy regarding immigration of Japanese during the remaining years of the war provided a source of continuing diplomatic difficulties.

One of the immediate benefits from Japanese naval coverage in the Pacific was that it allowed the United States to move naval forces from the Pacific to directly aid the British. The agreement between the American and Japanese government made it possible for the United States to withdraw ships from the Philippines and from the Western Pacific as those waters were protected by Japanese vessels. The Japanese warships patrolled the Pacific Ocean from Japan to Manila, then to Honolulu, and as far south as the South Sea Islands.[24]

Summary

In the final years of the War, Japan was requested to provide more naval assistance in the European Theater. The response mentioned that Japan was already in the Pacific Ocean, Indian Ocean, Australian waters, the Mediterranean, and in 1918 in Vladivostok. Earlier requests of the Japanese included solicitations for purchase of a modern Japanese battleship that are refused.

The primary reason for the Anglo-Japanese Alliance stemmed from a British need for naval support in parts of the Pacific Ocean to counter German naval capabilities in that region. Japan fulfilled that requirement and more. With the end of the war, the 1919 Peace

Conference in Paris and the January 1920 Treaty of Versailles legitimized the wartime Japanese land expansion and initiated Japan's acceptance as a world power. The German islands in the Pacific north of the equator were mandated to Japan with virtual sovereignty.[25] At this time, the Japanese Navy was third in the world.

The Peace Conference also established the League of Nations to work toward and implement international security to preclude conflict. During the negotiations for the League, Japan proffered a clause in the League's covenant that would prohibit racial discrimination. It was rejected.

Japan's participation in the war, although important and in some ways critical, was small in comparison with other warring nations from the viewpoints such as manpower involved, manpower and civilian losses and cost. Consequently, the participation of Japan on the side of the Allies is not frequently cited in historical writings about World War I. It is for this reason that the purpose of this article is to bring attention to some of the events demonstrating Japan's role.

Anglo-Japanese Alliance Ends

The Washington Conference (1921-22) also known as the International Naval Conference on Naval Limitation included the signing on December 13, 1921 of the Four-Power Treaty between Great Britain, France, Japan and the United States. It provided that all the signatories would be consulted in the event of a controversy between two of them over "any Pacific Question"[26], and a pledge to respect each other's rights in their island possessions in the Pacific. The replacing of the 1911 Anglo-Japanese Alliance by the new agreement was considered a major accomplishment.[27]

Endnotes

1. Ernest W. Clement, *A Handbook of Modern Japan*, A.C. McClurg & Co. Chicago, 1907, 157.
2. Timothy D. Saxon, "anglo-Japanese Naval Cooperation, 1914-1918", Naval War College Review, winter 2000, p. 14; Saxon provides a thorough treatment of the Japanese participation.
3. Paul G. Halpern, *The Naval War in the Mediterranean 1914-1918*, Naval Institute, Annapolis, MD, 1987, p. 258.
4. Arthur J. Marder, *From the Dreadnought to Scapa Flow*, Vol. 1 *The Road to War, 1904-1914*, London: Oxford University Press, 1961, p. 40.
5. Hew Strachan, *The First World War: Volume I To Arms*, Oxford University Press, 2001, p. 14.
6. Stephan Howarth, *The Fighting Ships of the Rising Sun: The Drama of the Imperial*

Japanese Navy 1895-1945, Atheneum, NY, 1983, p. 82.
7. Ibid., p. 117.
8. Halpern, op, cit., p. 12.
9. Strachan, op. Cit., p. 442.
10.
11. Saxon, op, cit., p. 797.
12. Strachan, op, cit., p. 797.
13. Www.naval-history.net/WW1NavyJapanese.html
14. Saxon, op, cit., p. 17.
15. Hew Strachan (editor), World War I: A History, Oxford University Press, 1998, p. 181.
16. Http://www.navalhistory.net/WW1NavyJapanese.html, p. 1.
17. Arthur J. Marder, From the Dreadnought to Scapa Flow, The Royal Navy in the Fisher Era 1904-1919, Victory and Aftermath (January 1918-July 1919), Vol. V, Oxford University Press, New York, 1970, p. 36.
18. Ibid., p. 37.
19. Http://www.hjarboro.ndirect.co.uk/ravworth.htm
20. New York Times, May 26, 1917, p. 3:8.
21. Naval Institute Proceedings vol. 43, #7 (Whole 173), July 1917, p. 1616.
22. Arthur J. Marder, *From the Dreadnought to Scapa Flow, The Royal Navy In the Fisher Era, 1917: Year of Crisis*, Vol. 4, Oxford University Press, New York, 1969, p. 95.
23. Halpern, op, cit., p. 388.
24. New York Times, January 2, 1918, p. 11:5.
25. Ian Gow, Military Intervention in Pre-War Japanese Politics, RoutledgeCurzon, London, 2004, p. 77.
26. Encyclopedia Britannica, fifteenth Edition 1990, 12:510:2a.
27. Lawrence H. Douglas, "The Submarine and The Washington Conference", Naval War College Review, March-April 1974, p. 96.

INTERCEPTION OF NEAR EARTH OBJECTS FROM AN SSBN

by Dr. Richard B. Thompson

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Periodically, one hears in the news of the impending collision of an asteroid or comet with the Earth, with the consequent end of life as we know it, downfall of civilization, etc. Typically, the news is followed within a few days by the announcement that the object in fact will miss Earth by millions of miles and there is no cause for alarm. While these "false alarms" are cause for some merriment, some responsible opinion holds that the threat of a significant catastrophe from such a collision is small, but not zero (Morrison, et al., 1994). Moreover, the colossal destruction wrought by even a modest size object (like the estimated 50 meter Tunguska meteorite whose kinetic energy of roughly 20 megatons flattened 1200 square kilometers of Siberia in 1908) argues that steps should be considered to avoid it if possible. It turns out that for a subset of these objects the Submarine Force, and the SSBN in particular, offers unique advantages in deflecting or destroying objects that might threaten the Earth.

Near Earth Objects

Near Earth Objects is the term that has been coined to describe any of a variety of spaceborne matter likely to pass in the vicinity of the Earth. Some of these are familiar, including comets (kilometer-sized dirty snowballs whose outgassing as they are warmed in proximity to the Sun results in the characteristic tail), meteorites (sand grain and larger bits of rock whose fiery entry into the upper atmosphere gives rise to *shooting stars*) and asteroids (kilometer-size and larger aggregates of rock which are mainly found between the orbits of Mars and Jupiter). While most meteorites are small and fall harmlessly, in the Earth's history it has collided several times that we know of with mutikilometer-sized objects, which caused global scale devastation.

The best known of these is the comet or asteroid that hit the Earth near the present-day Yucatan, 65 million years ago, creating a dramatic climate change which resulted in the annihilation of the dinosaurs (Alvarez, et al., 1980). The impact of even a smaller object (some hundreds of meters across) is likely to be a substantial catastrophe, with epochal earthquakes and tsunamis devastating entire ocean basins and killing millions. The high impact velocity (estimated at 20 km/sec) of a 75 m iron meteoroid caused the milewide Meteor Crater in Arizona. The Christmas 2004 tsunami that killed more than 200,000 people in the Indian Ocean basin underscores the devastation that tsunamis can cause; the fact that 70% of the Earth is covered by oceans makes a tsunami a likely consequence of any substantial impact. The energy release of the Tunguska object (which burst 8 km in the air) was comparable to that of the earthquake off Sumatra which caused the 2004 tsunami.

Threat to Mankind from Near Earth Objects

Yet, how likely is such a collision in the foreseeable future? Recent estimates of the likelihood vary. One estimate is that the odds of a one kilometer-sized meteorite striking in the next century are one in five thousand, whereas an encounter with a meteorite like the one that devastated Siberia in 1908 should occur roughly once a century. A more recent estimate based on military satellite observations of 300 meteorite explosions in the atmosphere suggests the frequency is ten-fold less. Nevertheless, there have been some recent close encounters. On March 18th, 2004, a boulder 30 meters across (named 2004 FH) passed within about 30,000 miles of the earth; it had been discovered just 3 days previously. On September 29th the largest asteroid known to pass close to Earth (named Toutatis, 4.6 km across) came within about a million miles of Earth. On the 19th of December a relatively small object (5 meters) named 2004 YD5 passed within 22,000 miles of earth (closer than geosynchronous satellites). Having approached the Earth from the direction of the Sun (and towards the Southern Hemisphere, where there are fewer telescopes), it was not detected until two days *after* it had passed over Antarctica. A five meter object would most likely have broken up upon entering the atmosphere and caused little damage. By comparison, objects sizable enough to cause global catastrophe (kilometers in diameter) are estimated to impact the

Earth only once every 300,000 years or so. Thus while the threat is small, it is to some extent quantifiable, and the potential devastation of even a modest size object argues that steps to avoid this should be considered.

Detection and Interception

The first issue is whether the object can be detected soon enough to take any action. A multikilometer asteroid impact might be devastating, but is also likely to be detected years in advance because of its size: Toutatis' encounter last year was predicted years in advance. Most NEO's may be found roughly in the plane of the Earth's orbit around the Sun, and with modern telescopes even advanced amateurs can observe them; for instance, asteroids such as Pallas (300 miles across) can be observed millions of miles away. Several thousand objects of kilometer size and larger have been discovered and their orbits around the Sun determined with high accuracy. NASA has a Congressional mandate to find and determine the orbital parameters of all NEO's 1 km or larger; it is believed that there are roughly 500 remaining uncataloged in the Earth's vicinity. There are other ongoing watches maintained, perhaps the best known is the Spacewatch Project of the University of Arizona. While the kilometer-sized objects are trackable at long ranges, smaller objects (~ 100 meters or so) are less detectable: under favorable circumstances they can only be detected a few days prior to impact. Certainly these objects are more abundant than kilometer-sized objects, and although they are perforce less destructive, their abundance and difficulty of detection might represent a greater threat. A related issue is the detectability of even large objects having low reflectivity.

Also germane is the question of what, if anything, may be done about it if an NEO is likely to collide with the Earth. For large objects whose encounters can be predicted decades in advance, one can imagine launching a vehicle to rendezvous with the asteroid, as the Deep Impact spacecraft rendezvoused with comet Borrelly in 2001, and undertaking some intervention to prevent the impact. This intervention might take the form of demolition of the asteroid (perhaps using a nuclear device), or deflection of its course by attachment of

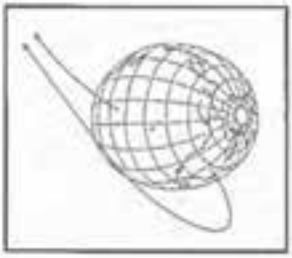
some source of thrust to its surface (Canavan, et al., 1994). Given sufficient time (years), changing the orbital velocity of an asteroid by only 1 cm/sec should be adequate to avoid a collision. For smaller NEO's detected only days in advance of impact, rendezvous is clearly infeasible. However, nearby detonation of a missile nuclear warhead should be quite capable of deflecting 100 meter-sized NEO's, if not breaking them up altogether.

The really salient question is can an intercept mission be mounted sufficiently long enough before impact (e.g., sufficiently far away from the Earth) to adequately deflect or break up the NEO, given that a smaller (hundreds of meters and below) NEO is likely to have been detected only days before, and only tracked with adequate precision for the last several hours. Ideally one would wish to intercept as soon as possible, to maximize the time for any deflecting impulse to steer the target wide of the Earth. Thus a typical mission might only have a few hours to intercept, putting a premium on a quick response and a high speed vehicle. For a launch on short notice the preferred vehicle is of course a solid-fueled missile, which can be stored essentially indefinitely and launched within minutes of order receipt. Ideal candidates are ICBMs and SLBMs, designed to be launched within minutes of receipt of the order. By comparison, current boosters used for interplanetary launches are at least partly liquid-fueled, and thus take days or weeks to prepare for launch.

The typical flight profiles for vehicles leaving Earth's gravitational field comprise launch into a low parking orbit, followed by an injection burn to achieve escape velocity. This is done to maximize the payload for a given amount of launch thrust, and to utilize the 1000 mph additional velocity enjoyed by rockets launched towards the east from sites near the Equator such as Cape Canaveral or Kourou. Such profiles are only feasible for rocket stages which can be restarted in space, which do not include current US ICBM's or SLBM's. For an NEO interception mission (where payload may be less of an issue, and time is of the essence) such flight profiles are probably suboptimal. By comparison, a more direct ascent to the target is faster. Clearly a direct ascent of this sort could be made by a suitably modified ICBM with its MIRV multiple warhead bus replaced by a lightweight single warhead to maximize speed.

SLBM's for NEO Interception

The unique and crucial advantage the SLBM enjoys over land-based ICBM's is that it can be based anywhere in the world's oceans, and thus have a more direct, higher speed flight path to targets arriving from different azimuths. For an NEO approaching the Earth, launch sites in North America only face the target part of each day, and given a firing solution at any time, may have to wait up to twelve hours to launch--a delay that may prove unacceptable. By comparison SSBNs in the Atlantic, Pacific (and potentially Indian) Oceans give much more frequent opportunities to launch. For a direct ascent to a target approaching (for instance) from a high southern latitude (like 2004 YD5), a missile launched from North America would have to take a less direct path than one launched from the Southern Hemisphere, like that in the **Figure**. This would result in a delayed intercept. Obviously several launch sites exist in the Northern Hemisphere in Europe and Asia, but many fewer south of the Equator. Possible launch sites might include Diego Garcia or Kwajalein Atoll, but the political issues in basing nuclear-tipped missiles there (even for a manifestly good cause) are obviously substantial.



As a potential asteroid interceptor the Trident SLBM has an advantage over Minuteman ICBM's due to its greater throw weight, which translates into greater terminal velocity for the same size payload carried by the Trident. Exact figures are classified, but the relative size of the missiles and their maximum payload (3 RV's for the Minuteman vs. 14 for the Trident) gives an idea of their relative capabilities. The MIRV bus on the missile will be replaced by a lightweight warhead carrier, capable of modest maneuver for terminal guidance. The nuclear warhead itself need not be encapsulated within a heavy reentry vehicle and current "physics packages" for cruise missiles weigh less than 200 pounds. SLBM's already possess high precision inertial guidance systems, but they obviously are programmed for targets on the earth's surface. However, the interception point is likely to be refined by further observations of the target while the interceptor is en route so command guidance for the terminal phase

is likely to be necessary. In intercepting an object not trying to evade interception, the NEO interceptor in some ways has an easier task than our kinetic kill ABM's which must actually hit the target. However, the relative speeds of the interceptor and target NEO will be much larger than that of an ABM intercepting a reentry vehicle, and the interception must take place thousands of miles up in space. The warhead will require a radar-directed proximity fuse to detonate the device at closest approach.

A third advantage of the SLBM is that being launched in mid-ocean, it can be launched at any azimuth without passing over inhabited land early in its flight path. By comparison, ICBM's launched from the American Midwest in any direction but north are likely to pass near population centers on the American coasts, and be dropping spent first and second stages near populated areas. The same might be said of missiles launched from many other sites in the Northern Hemisphere. By comparison, the SLBM drops its stages at sea, and the launch is unlikely to even be observed, except by satellite.

An SSBN can carry out this mission with little impact on its primary mission of deterrence. The SSBN would go to sea on deterrent patrol as usual, except that two of its missiles would have asteroid interceptor payloads instead of MIRV buses. Inasmuch as the interceptor missile differs from the Trident SLBM only in its payload, it can be stored and launched almost identically. The small interceptor warhead would appear overtly different from the standard payload from the standpoint of arms control verification. From the standpoint of the SSBN the launch procedures also need differ little. Probably a salvo of two missiles would be launched a few minutes apart to provide a backup in case the first fails. If further refinement of the track of the NEO reveals it will in fact miss the Earth, the warhead need not be detonated and it will proceed harmlessly into interplanetary space.

REFERENCES

*Alvarez, L. W., Alvarez, W., Asaro, F., and Michel, H.V., "Extraterrestrial cause for the Cretaceous-Tertiary extinction," *Science* 208, 1095 – 1108 (1980).

*Canavan, G. H., Solem, J.C., and Rather, J.D.G., "Near-earth object interception workshop," in in *Hazards due to Comets and Asteroids*, (T. Gehrels, ed.) Tucson: University of Arizona Press, pp. 93 – 124 (1994).

*Morrison, D., Chapman, C. R., and Slovic, P., "The impact hazard," in *Hazards due to Comets and Asteroids*, (T. Gehrels, ed.) Tucson: University of Arizona Press, pp. 59-91 (1994).

NAVAL ARCHITECTURAL ASPECTS OF AMERICAN NUCLEAR SUBMARINES' DESIGN

by Dr. George Sviatov
Naval Architect, Captain 1st Rank, Russian Navy(Ret)

In April of 2004 in THE SUBMARINE REVIEW, a commentary was published "Bigger is Better - Sometimes" by distinguished naval author Mr. Norman Polmar and titled "Commentary on Commentary" by not-less-distinguished, seasoned submariner Rear Admiral W. J. Holland about contemporary development of the United States nuclear submarines.

In his Editor's Comments Captain Jim Hay, stated: "There is also a DISCUSSION between Norman Polmar and Jerry Holland about that perennial issue of whether we should build big submarines or small submarines. This contrast in opinion has a lot to do with money and is as old as the US Navy itself. Anyone with a position in this discussion is invited to join in."

Norman Polmar is my old friend. In 1965 I translated his first book Nuclear Submarines, which had been published in Moscow by the Publishing House *Atomizdat*. At that time I was a senior research fellow at the Institute of Military-Technological Information in Moscow, a naval architect, Captain 3rd Rank of the Soviet Navy with eleven years experience in designing and building of the first Soviet nuclear submarines and some knowledge about American nuclear submarines' development. In 1969 as a naval architect, Candidate of Technological Sciences, Captain 2nd Rank, I published in the Publishing House *Voenizdat* my first book Nuclear Submarines about Soviet but mainly American subs. And in 1972 as head of the Military-Technological section of the Institute of US studies of the Soviet Science Academy, Captain 1st Rank, I invited Norman and his wife Beverly to spend a couple of weeks as guests of that institute in Moscow and Leningrad. In the last 15 years of my living in the USA I published a dozen articles about contemporary American and Russian nuclear submarines and helped Norman mainly by translations from Russian to English of some Russian publications about nuclear submarines. So, I know Norman Polmar's point of view on the subject and he knows of my point of view. And I need to repeat a well-known saying: "Norman, you are my friend but truth is dearest of all!"

Relating to the contemporary development of American nuclear attack submarines the notion "Bigger is Better" is correct not sometimes but this time. Let me try to prove it.

The US SSN 21 SEAWOLF was authorized in 1989 and commissioned in 1997. She was the first *top to bottom* new attack submarine design since the Skipjack class in the early 1960s and unquestionably the best nuclear attack submarine in the world with her 8 26-inch torpedo tubes, 50 weapons, some 37 knots speed and some 600 meters test diving depth. She was the best product of American naval architects. Unfortunately, I do not know the name of her Chief Designer. I don't know why it is a secret in America, when it was not a secret even in the authoritarian Soviet Union. With an underwater displacement of 9,125 tons she was better than the Soviet best nuclear Project 971 attack submarine AKULA class (in American terminology) which has an underwater displacement close to 13,000 tons, 4 - 650mm and 4-533mm torpedo tubes, 40 weapons, a speed of 33 knots and a test diving depth 600 meters too. The last sub of that class, GEPARD, was commissioned in Russia a couple of years ago.

After the Third, this time victorious, bourgeois-democratic revolution in the Russian (Soviet) Empire, the collapse of the communist rule in the USSR in 1991 and establishment of the Russian Federation and the Commonwealth of Independent States, the United States lost their predicatable superpower-adversary with its comparable nuclear submarines' potential. As it was said in an old French movie Fanfan-Tulip, very popular in the USSR: "Our Enemy betrayed us, it turned its back to us!"

In 1992-2000 the Clinton Administration reduced the share of defense expenditures from some 5 to 3% from US GNP, cutting the number of their army divisions, navy ships and air force units. The long-range program of building 29 Seawolf class SSNs became a target for disarmament champions, who criticized it for excessive cost "more than a billion dollars for a sub". As a result, now the US Navy has two Seawolf class and one special Seawolf class (JIMMY CARTER) SSN's and recently commissioned VIRGINIA (SSN 774) the first of the newest class attack submarine.

To reduce the cost of Virginia-class new generation SSNs the US Navy decided to take as a prototype not the SEAWOLF but the Improved Los Angeles class SSN, first of all by her weapons number

and torpedo tubes and vertical missile launchers architecture. Of course, VIRGINIA is not an SSN-688I sub. She is much more sophisticated and capable in aspects of her nuclear reactor characteristics, possibilities of network communications, intelligence and reconnaissance in shallow waters, improved maneuverability, and the reduced number of watch standees. But in comparison with the Seawolf class she lost something: some speed, diving depth and number of weapons (38 instead of 50). But the most important loss, from the point of view this author, was losing the possibility to use drastic naval architectural potentials, which SEAWOLF had in her future development.

Now let me shift to the most important part of this article. What could we get instead of today's VIRGINIA, if the prototype had been taken as SEAWOLF and the Chief Designer of the sub was the author of this article?

It would be a VIRGINIA with underwater displacement some 9,500 tons, length - 360 feet, beam - 40 feet, weapons: 8-21 inch torpedo tubes, 28 bow vertical *Tomahawk* missile launchers and (50+42+28=120) weapons, including 28 missiles and 92 torpedoes and missiles in any necessary combination. In other words, my VIRGINIA by her weapons potential would be equal to three SSN-774s. In addition, she would have had the speed (some 37 knots) and test diving depth (some 600 meters) of SEAWOLF and all improvements, including the reduced complement of VIRGINIA. By the way, if you go out of the submariner's envelope and look, for example, to the US Navy's Arleigh Burke-class destroyer with a displacement of 9,200 tons, you'll find a comparable number of missile launchers with weapons (96), or 128 missile launchers with weapons on DD-21 (DDG-103) new class destroyer with displacement of some 10,000 tons in addition to their artillery and other smaller weapons.

Such transformation of SSN-21 SEAWOLF to improved SEAWOLF from a point of view of a naval architect is very simple. It can be done by putting 42 additional reserved weapons behind or under the existing torpedo room and 28 *Tomahawk* missiles in the vertical tubes in a ballast tank in four transfers rows of six launchers (because SEAWOLF is 6 feet wider than VIRGINIA) and one row with four launchers.

What is the bottom line of my proposal? It is very simple:

One Improved SEAWOLF (SSN-21I) class = three VIRGINIA (SSN-774) class.

The last, and the most important question, from the point of view of my opponents, would be about the cost of my sub in comparison with those of the Virginia class? My answer will be very simple. If you take only one third of the SSN-21I weapons (38 instead of 120), the cost of her and VIRGINIA would be almost the same. So, it is your choice. To get one weapon on 71 tons of submerged displacement or on 210 tons?

The US Navy's SSN program managers and Electric Boat's naval architects, understanding the weakness of their position with VIRGINIA, relating the number of weapons, suggested in addition to her 38 weapons a "Two 4-Tube Modules" or "One 8-Tube Module" with probably 8x4=32 Tomahawk missiles, increasing her weapons number to 70 and the submarine length by some 12 meters and submerged displacement by some 1000 tons with a weapons/ton ratio of 9000:70=130, with some reduction of the sub's speed.

Does all this mean that now it is necessary to stop the SSN-774 Virginia class program and begin building the SSN-21I, improved SEAWOLF, program? Of course, not. The Virginia class subs have a lot of new and very valuable features: reduction of complement, non-penetrating periscopes, next generation battle control and communications electronics, nine-men lockout, and aircraft-type first and second pilots' dynamic control organs. But the naval architectural and cost-effective characteristics of improved SSN-21 programs are in such a degree advantageous, that it is impossible to ignore them for the next generation of the United States' nuclear attack submarines.

Even the comparison of the SSN-21I class sub with her 120 weapons and the Ohio Class SSGN with her 154 Tomahawk/Tactom missiles' launchers plus 4 torpedo tubes with 25 missiles/torpedoes (179 weapons) with the indicator of displacement per weapon (18,000:179) of 106 tons, which is worse than 71 tons.

It is understandable that the United States Navy wants to have not 50 but 100 nuclear attack submarines and if that was possible, my friend Norman Polmar would be correct. "Bigger is not better - this time". But reality is not in the direction of 100 SSNs in the US Navy. According to the excellent study of the Lexington Institute Submarines: Weapons of Choice in Future Warfare in 2015 the USA will

have some 61 SSNs (3 Seawolf, 4 Ohio SSGNs, 13 Virginia's and 41 Los Angeles class). In the 2025 - 59 SSNs (3 Seawolf, 4 Ohio SSGN, 30 Virginia, 11 Los Angeles and 11 Future Submarine class. It seems to this author that this *Future Submarine* should be as discussed above an *Improved Seawolf Class* (SSN-21I) new American nuclear attack submarine with 120 weapons and a 9500 tons underwater displacement.

Naval architecture is a very old profession. It worked many centuries without computers and now is working with contemporary very fast and efficient computers. There always was a competition for influence between naval architect-chief designer of a ship and her experienced Navy program manager and first commanding officer. Who is more influential depends mainly on the personalities. Sometimes a naval officer is more experienced, better educated, smarter, sometimes the more superior is a naval architect.

But for a good naval architect it is necessary to know more about the history of that class of ships and about the history of these ships' development in other countries. In other words, there are two professions: to drive cars and to design them. From the point of view of the author of this article the role of naval architects in the United States is insufficient relating to the nuclear submarines' development. We need to know a name of naval architect-chief designer from the Electric Boat of General Dynamics for the new generation of US nuclear attack submarines.■

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26 APRIL 2005

The following is an excerpt from the ceremonial pamphlet of the most recent change of command for USS HAWAII (SSN 776). It describes the professional biography of the outgoing commanding officer, CDR William Tiberius Dorr, who was in command of the USS HAWAII from April 2032 to June 2035.

"CDR W. T. Dorr received his commission from the United States Naval Academy in June 2014 after earning a Bachelors of Science Degree in Aerospace Engineering. Following nuclear power training and the Junior Officer Tactics and Seamanship (JOTS) School in Charleston, South Carolina he was assigned to the Strike Squadron (CSS-7) in Pearl Harbor, Hawaii onboard USS CHEYENNE (SSN 773), where he served as Sonar Officer, Main Propulsion Assistant and Communications Officer. In June 2019, he was assigned as a staff officer to the Commander Submarine Force Pacific Fleet at which time he earned a Masters in Business Administration from Hawaii Pacific University.

In July of 2021 he attended the Advanced Submarine Tactics School (ADSTAC) in Groton, Connecticut and graduated with distinction before being assigned as Weapons Officer to the Expeditionary Squadron (CSS-6) in Norfolk, Virginia onboard USS FLUCKEY (SSGN-24). His tour on FLUCKEY was highlighted by a deployment in support of OPERATION SNOW where FLUCKEY conducted strike operations, including the insertion of a company of Special Operations Forces, to neutralize a notorious paramilitary drug cartel with ties to South American terrorist organizations. CDR Dorr was instrumental in coordinating the logistics of weapons and supplies to the SOF Company and its allied forces for over a 5-week period. His creative management of the ballistic delivery system allowed allied forces to extend their reach well into the jungles of enemy territory, ultimately assuring mission accomplishment, and setting a new standard for Sea Basing.

In February 2025, CDR Dorr was assigned to the Joint Research, Development and Tactics Center (JRDTC), Counter Asymmetry Division. In August 2027, after attending the Submarine Executive Course (SEC), he was assigned as Executive Officer to the SOF Squadron (CSS-11) in San Diego, California onboard USS ARIZONA (SSN-782). In August 2029 he attended the National War College at the National Defense University, Washington D.C. earning a Masters of Science in Foreign Policy Strategy. He was then assigned to the Operations Directorate of the Joint Staff until he started the Commanding Officer training pipeline in September 2031.

In May 2032 CDR Dorr took command of USS HAWAII (SSN-776), attached to the Strike Squadron (CSS-15) in Guam, and led the ship on a very successful deployment in support of the Southeast Asian Campaign in Myanmar (Burma) last year. After successful reconnaissance and strike missions in support of the war, he led USS HAWAII on a four-week counter-piracy operation near Indonesia that prevented the capture of 5 major supply ships."

CDR Dorr's biography sheet is typical of today's submarine commanding officer in that it bears the fruit of military transformation that began at the turn of the century following the terrorist attacks of 9/11. Though it could be argued that the true seeds of military transformation were planted in 2006 with the rewrite of the National Military Strategy (NMS), it is safe to say that the Department of Defense (DOD) recognized that it needed to transform the way it conducted business as a result of Operations Enduring Freedom and Iraqi Freedom. Nevertheless, historical evidence demonstrates that the sudden and rapid transformation of the military from a late 20th century force of attrition to a 21st century force of flexibility began in 2010.

The catalyst of transformation in 2010 was the result of budget deficits, improved operational tempo efficiencies, restructuring of the active and reserve components, and the full implementation of the global communications grid (GCG). The budget deficits placed political pressure on the President and Congress to take actions to reduce the spending of the government. Fortunately for the politicians, the Secretary of Defense had been forcing the Service Chiefs to incrementally develop new initiatives that would improve operational tempo without stressing the personal lives of the service men and women under their responsibility. Some of these initiatives resulted in

the improved system reliabilities and logistical efficiencies that we take for granted today. Additionally, the restructuring of the active and reserve components of the armed services in 2007 ensured that the right numbers of people were being trained with the right combination of skills. This particular initiative reduced the reserve components by 40 percent since nearly all of the low demand skills were phased out of the reserve programs. The GCG started out as a system based on the old binary computing systems and was viewed as a panacea to the military's information systems of that time. It was not until the advent of the quantum computer in 2010 that the full potential of this system was finally realized.

It should come as no surprise then that the military officer who best personifies the past 25 years of military progress is CDR Dorr. His appointment to the United States Naval Academy in 2010 juxtaposes his entire professional development with that of the military of the 21st century. Analyzing CDR Dorr's career demonstrates the many initiatives within DOD during the past 25 years that not only affected the transformation of the Submarine Force, but that of all the services.

The Formative Years. When CDR Dorr was admitted into the Naval Academy on July 1st 2010, the military services were held in high esteem with the American public. After the successes of Afghanistan and Iraq, and with the help of an aggressive State Department international public relations program, the American military was viewed as a noble profession that made great sacrifices not just for the good of the United States, but also for the good of the world. A new culture was bred within the U.S. military that lives to this day: *we are the defenders of freedom, protectors of the weak, and the first in line to halt the progress of evil.* After the pull out of U.S. troops from Afghanistan and Iraq in 2008, many of the world's political leaders grudgingly admitted that the United States was not abusing its superpower status to expand an *empire*. By 2010, American popularity had gradually risen around the world, which resonated in renewed American patriotism on the home front. The average citizen viewed joining the U.S. military as becoming part of special club of noble warriors who excelled in their skills defending freedom and the American way.

The Academy itself had already been two years into its new

academic and professional education curriculum. Starting with the class of 2012, all of the service academies were required to roll many elements of their summer professional education programs into the academic year in order to make room for a joint service professional development (JSPD) program. The JSPD program started out with each of the academies hosting a four-week program that educated the cadets and midshipmen on the specifics of each service. It has since expanded into a six-week program that includes a week of joint leadership forums focusing on case studies of effective military leadership and a week of joint war-gaming via the secure GCG.

The Submarine Force shifts a paradigm. Until 2009, the Submarine Force continued to present itself as a multi-mission force that was uniquely qualified to perform many missions vital to national security interests. While this was, and still is, very true, the problem with the Submarine Force was that it was a victim of its own *Silent Service* mentality. Only a handful of congressional representatives fully grasped the potency of a submarine in support of reconnaissance, strike, maritime warfare, and sea basing. To make the Submarine Force's capabilities more apparent without compromising the classified (and stealthy) nature of operations, the Commander of Naval Submarine Forces directed a realignment of submarine basing predicated on specific submarine missions. This was a leap from the traditional homeporting of a submarine based on its design as a SSN, SSGN or SSBN. The result of this decision gave us the submarine squadrons that we have today; the strike squadrons, the expeditionary squadrons, the special operations force (SOF) squadrons, and the strategic deterrent squadrons. CDR Dorr's first assignment was to a strike squadron based out of Pearl Harbor, Hawaii. The other strike squadron is based out of Groton, Connecticut.

The benefits of this realignment have been tremendous. Each squadron is able to focus its training and material support on delivering a specific effect to the theater commander. With each squadron training its submarines to a core competency of strike, expeditionary warfare, special operations warfare or strategic deterrence, the submarine force has been able to generate an economy of scale from a platform specific standpoint. Instead of training on a multitude of missions that the President, Joint Chiefs, Combatant Commanders or

Congress may find overwhelming, the Submarine Force now has squadrons of submarines that are constantly ready to perform specific missions with very little workup time required. This has made it very easy for campaign planners to assemble the maritime component of the Joint Modular Force on short notice. The submarine force has been able to surge deploy itself on short notice for over twenty years now. The modular design of the VIRGINIA class and the subsequent FLUCKEY class SSGNs has been crucial in keeping construction costs down since each ship is built to support a squadron's core competency. Each sensor package, weapon configuration, UUV/UAV load out, and size of the lock-in/lock-out chamber is tailored to meet the specific needs of the squadron's mission tasking. Needless to say, the Submarine Force continues to hold itself to higher standards and routinely trains outside of the squadron core competencies as a hedge against the unpredictable nature of maritime combat.

Sea basing as a core competency of all naval ships. When CDR Dorr reported aboard USS FLUCKEY (the lead ship of our new class of SSGNs) sea basing was already a core competency of all naval ships, regardless of size. This concept had a rocky start after it was first introduced in 2002. It took many years for the Navy to effectively communicate this concept to Congress and the military leadership. Many of its critics argued that it was a new name for existing capabilities while others argued that it placed the sea-base at risk due to the dependence on sea lines of communication. An adversary would simply have to disrupt the line between the ship and the shore to adversely impact the effectiveness of such an operational concept. These concerns were well justified, but they were formulated without regard to what was once called the Sea Shield concept. As described in the original Sea Power 21 document, the Sea Shield concept provided sea control, assured access in all of the world's littoral areas, and projection of defense overland. It essentially assured that the sea-base would be able to maintain its logistical effectiveness while in support of amphibious operations. The Sea Shield concept has since been absorbed into the Joint Theater Defense System (JTDS).

The advantage of sea basing has been demonstrated over the years, but it wasn't until the Navy developed improvements in delivery systems and established the Tailored Logistics System (TLS) that the

sea basing concept became a requirement of all naval ships. The Naval Ballistic Delivery System (NBDS), UUVs and UAVs have been instrumental in delivering supply payloads to ground forces, coastal patrol units, and other naval vessels. The payloads have ranged from munitions and weapons to medical supplies and food. The TLS was brought online in 2015 to facilitate rapid delivery of personnel, equipment and supplies to units in need of immediate relief. The objective of the TLS is to extend the military reach of our forces from the sea to points inland using all dimensions of space. It allows the on scene commander to request a wide range of payloads, via the GCG, based on the standardized load outs that we place on every deployed ship of the fleet. The versatility of the system is that it allows the host ship to put together a tailored package for the on scene commander without wasting valuable payload space. It has been instrumental in sustaining the operations of our marines and SOF as they conduct various operations around the world. The sea basing capabilities have been folded seamlessly into the Joint Modular Force (JMF) concept that was born in the rewrite of the 2006 NMS.

A new way of force structure. CDR Dorr's deployments on the USS FLUCKEY and the USS ARIZONA were typical of any submarine that had a role in a Joint Task Force (JTF) created under the JMF concept. The JMF structure was the result of a shift in campaign planning theory in 2007. The 2006 NMS placed threats to U.S. national interests into four categories: conventional, irregular, catastrophic and disruptive. It was well recognized that the U.S. military could respond to any conventional threat, but it was less certain that the military was structured to respond to a wide range of threats on a moment's notice. The 2006 NMS attempted to address these concerns by shaping the military force into an expeditionary organization. The problem with this initial approach is that it required a vast amount of resources to equip, train and deploy the full complement of a JTF. The services were still very parochial with respect to predeployment preparation and training of their oversized units, consequently, there was an inefficient duplication of effort. Additionally, it was inevitable that there would be stovepiped efforts that ultimately had to be worked out in theater, detracting from the readiness of the JTF. The Joint Chiefs concluded in 2008 that there

needed to be a better way to build a joint force able to respond to the wide range of conventional and non-conventional threats. The result of this conclusion was the Joint Modular Force.

The JMF allows Combatant Commanders (COCOMS) to build a *made-to-order* JTF that takes advantage of explicit skill sets within each of the services. As a result of the shift to a capabilities based procurement process in 2003, each of the services has been able to refine its specialties in a complementary fashion. Each service has been able to efficiently use all of their limited resources to structure their forces to a specific set of effects, vice trying to structure to an all-purpose capability. The services no longer need to duplicate efforts to build the all-purpose tool. That responsibility belongs to the COCOM who now has a deep chest of finely honed tools that he can use in any combination or number. The ability to piece together five Army battalions, three Marine battalions, five SOF companies, three fighter wings, three bomber wings and an assortment of ships and submarines has become a matter of routine for the COCOM. What used to take nearly a year of planning with significant retooling in theater is now done in 90 days. The GCG, the Joint Logistics Command and the Joint Forces Training Command have made it possible to assemble and prepare the units mentioned above in only 13 weeks. Since each unit is always ready to deploy, the only pieces of the puzzle that need to be inserted are those pertaining to communication plans, logistics plans and coordinated rehearsals. The universal application of the GCG with its unlimited bandwidth has simplified coordinated operation from the operational to the tactical level.

After the 13 week work up period, the JTF is prepared to respond to its specific crisis. Second and third echelons of units are trained in parallel in order to support sustainment of operations in the unlikely event that the crisis turns into one of attrition. Because each service maintains smaller and more specialized units than they used to, they are able to prepare more of these units while leveraging economies of scale in both training and supplies. The JMF has made our military fast, coordinated and lethal. This combination has allowed the United States to respond to any threat, in any medium, at any time.

Listening to the customer. CDR Dorr's post department head shore tour at the Joint Research, Development, and Tactics Command

(JRDTC) signifies one of the greatest advancements of the military in the past 20 years. The JRDTC was established in 2019 in response to the West African conflict of 2016. U.S. forces found many pieces of their equipment faltered in the harsh environment and some of the adaptive tactics taken by the fascist militia neutralized some critical electronic systems. Despite the standardized sea-base combat load out of the ships in the region, the on scene commanders actually needed rapid modifications to their gear. It was during this conflict that one of the Navy's Admirals recalled an old reality television show called "The Apprentice" where contestants vied in a series of business challenges. In a few of the episodes, the contestants were tasked with designing, producing and marketing a product in one week. Given direct access to machine shops and design studios, it was rather simple to build just about any product in a week. If the television show contestants could do this in a week, why couldn't the most potent military in the world? The Admiral convinced the Joint Chiefs to establish the JRDTC the following year.

The objective of the JRDTC is to develop new equipment and tactics based on recent operational experience. This ensures our military personnel are equipped with the latest technologies, tactics and equipment while standing in harm's way. The GCG provides real time feedback from the theater of operations to ensure that the JRDTC is listening to the customer. The JRDTC has direct links to the industry with a budget sizable enough to start immediate production of new equipment until congressional supplementals can sustain production for the current conflict. The JRDTC is networked with all of the service specific labs and the university applied research labs to maximize development of solutions. During the conflict in Southeast Asia last year, the JRDTC was able to modify our military's thermal imaging systems to overcome a new thermal coating applied by the adversary. The turnaround from initial detection of the adversary's countermeasure to delivery of the upgraded systems was six days.

The future looks bright. The United States military has seen many improvements in capabilities over the past 25 years but it was the shift in military preparedness and force structure that had the most impact on transforming the military from an organization based on 20th century attrition to one based on flexibility and efficiency. CDR

Dorr's career is a testament to the changes within the submarine force and how they mirrored those of the other services. The popularity of the U.S. military, as advertised by the Department of State's international goodwill pubic relations campaign, assured we would get the best and the brightest volunteers to stand for all that is good in the world. CDR W. T. Dorr is one of those volunteers. The maturation of the Navy's sea basing concept moved beyond the large deck ships to the smaller Littoral Combat Ship and the stealthy submarine force. To this day, submarines are the most effective platform for the sustainment of clandestine operations, particularly the FLUCKEY class SSGN. The restructuring of the submarine squadrons was a bold step towards the JMF concept that ultimately helped reshape the structure of the military. The continuous refinement of the JMF doctrine will provide many more decades of fully deployable assets and flexibility for the COCOMS. The JMF has demonstrated that it is the ultimate multi-purpose tool that takes on many shapes and sizes depending on the assigned mission.■

BUBBLEHEAD IN BAGHDAD

Commander Eric Jabs, U.S. Navy Reserve
with thanks to Major Dave van Dyche, USAF

CDR Eric Jabs is a (full time) Reserve Submariner. He is NATO's Exercise and Operational Support Officer at Allied Command Transformation, in Norfolk, VA.

Maj Dave van Dyche is a USAF Intelligence officer and former Army infantryman, currently assigned to Supreme Headquarters, Allied Powers Europe, in Mons, Belgium.

"What the heck is a submariner doing in the desert?" is what many people asked me and my wife during the last quarter of 2004. Well, this situation is not as unique as it first appears, and in my opinion such deployments will become more common in the future, as the Navy shoulders a larger land mission in the Global War on Terrorism. In any case, I offer a snapshot of potential challenges and rewards that await in an Iraq assignment. Included in this tale are some thoughts on how Navy experiences and Joint Professional Military Education can help when operating in a multi-cultural, joint, and interagency environment. So, this is the story of my transit to and time on station, in Baghdad, where mortars and rockets fell with unpredictable frequency, small arms crackled constantly, and suicide bombers rocked the world with deadly blasts.

Setting the Stage

Reporting aboard NATO's Allied Command Transformation in August 2004, the place was abuzz with talk about a pending order for staff members to deploy for three months to Iraq. This was previously unheard of in that Alliance strategic command and it certainly upset a lot of old paradigms about what NATO duty entailed. Those perceptions were soon shattered as the opportunity to deploy was real, and NATO expanded its security role outside of Europe to include Iraq as

well as Afghanistan. I volunteered for the mission, justifying it by: a recent trip to the Gulf States, Middle East specialization at National War College, and extensive field deployments as XO of US Southern Command's Deployable Joint Task Force Augmentation Cell. It didn't hurt that I had just reported and could request that another Reserve Commander take on duties as Operational Support Officer.

The Mission

The North Atlantic Treaty Organization came to Baghdad at the behest of the Iraqi Interim Government in August 2004. The group was titled NATO Training Implementation Mission-Iraq (NTIM-I). Our mission was to assist in the training of Iraqi Security Forces, along with some equipping and technical assistance. This mission was to be distinct from that of Multi-National Forces-Iraq (MNF-I), but working closely with that coalition. No combat or combat training was involved. The objective of NATO's support was to help Iraq build the capability of its government to address the security needs of the Iraqi people. The timing of this mission corresponded to the ramp-up of numerous events leading to Iraqi national elections in January 2005. About 20 NATO personnel from 10 nations started the mission on 18 August 2004 in Baghdad. It truly was *an Implementation* mission, as everything still needed to be established, and there were many lessons yet to be learned.

Deployment Preps

Preparing for Individual Augmentation to Iraq is quite different than preparing a warship and crew for deployment overseas. I highly recommend any folks in similar situations use the invaluable NAVCENT *gouge* built from veteran sailors' experiences: http://www.cusnc.navy.mil/MNFI/index.htm

While NATO deploys as a team, each nation is responsible for the predeployment training of its own troops. U.S. service members were routed through Fort Bliss in El Paso, TX. For those who have never experienced the Army way of doing things, it can be a bit of a shock. It is comprehensive preparation built to accommodate the lowest common denominator— including civilian contractors headed to that theater of operations. I emerged much better prepared, and equipped,

for Iraq. Additionally, as our unit went through together, it was a great team building experience to triumph over adversity in getting *validated* to deploy. Finally, the contacts made during those days in Bliss became valuable networking nodes during my time in-country.

With our national training complete, the larger team assembled in Naples, Italy, home to NATO's southern Joint Forces Command — operational commander for NTIM-I and for the (then) ongoing Bosnia operations. There, we met our colleagues with whom we would share the next three months in a combat zone. The group started to find its feet as a team as we went through the familiar first stages of development: forming and storming. [1] The Naples time was meant to focus us on the Iraq training mission, plus adding additional instruction that would be beneficial. It was also important here to fill gaps in equipment needed to enter the theater, especially as our team would deploy directly into Baghdad, instead of entering Iraq through the usual U.S. ports of entry, where body armor and ammunition are typically issued.

Into Theater

Our team lifted off from Naples on a USAF C-17 and landed at Balad airfield, northwest of Baghdad. Rapidly descending in a military aircraft into an environment where shooting can be expected is thrilling, to say the least. Upon deplaning, we were immediately assaulted by the absolute intensity of September temperatures in Iraq. *Dry heat*, we kept telling ourselves. We were met by a protocol officer toting an M-16—first time I've seen that particular combination. Ushered into an air-conditioned staging tent (thank you, Air Force!), we awaited nightfall for the helo lift to the International (nee Green) Zone. Distant thumps marked our first mortar attack—we were all glad they were far-off.

A CH-47 Chinook and UH-60 Black Hawks were staged for our departure. (Having a flag officer with your group certainly helps in laying on helos.) Once it was dark, bags are loaded centerline in the CH-47; we lined its sides plus available Blackhawk seats. We sat idling on the tarmac for 45 minutes—waiting for clearance to take off. The heat of the desert, combined with the turbines' exhaust, was unbelievable – at least 140 degrees Fahrenheit. I was certainly glad I brought so much water, which was rapidly consumed. I said to myself: "Self, wear goggles on any helo ride." The helo's open hatches

allowed a lot of fine sand to blast inside.

Contemplating the huge stack of bags that towered over us, we wondered what would happen if the helo banked hard. We also wondered: why the delay? Was there firing going on? Were we going over Sadr City, or some other hot spot? What if we went down—we hadn't yet received any ammo for our side arms. Locked and loaded machine guns point out into the darkness from the hands of veteran side gunners. Many thoughts fill all our heads as the rotors turned, and we awaited liftoff. One younger member launched into a monologue of comic baby-talk: interesting reaction to stress.

Finally, upward motion-airborne! Off we wisked, close to the ground and feeling the G's of a combat takeoff. The aircrew was pushing the envelope of their machine, ensuring we were a difficult target. We strained to peer out the side hatches—some areas were void of electrical lights, the city seemed huge. Then there was a river—must be the Tigris! We were going into the land of so much history, of Adam and Eve, and of Ali Baba. We landed at Washington LZ, and sure enough, a few of those bags tumble on top of us. A thud and an expletive proved the wisdom of wearing helmets inside fast-moving rotor-winged aircraft.

The International Zone

The International Zone (IZ), formerly known as the Green Zone, was an area of palaces, parks, and parade grounds during the Saddam years. Nestled in a major bend of the Tigris, it is now a fortress maze of high concrete barriers, concertina wire, and third-country-national guards. The guards are mostly Ghurkas and Filipinos, many ex-military, all perpetually vigilant, courteous and cheerful. These fellows paid their dues too, as shortly before Thanksgiving, an insurgent rocket attack killed four Ghurka guards when a round struck their tent-a grim reminder that indirect fire has little discrimination.

You can still see some of the lushness of the area when you look at all the trees and plants — most especially when compared to the area outside, commonly referred to as the Red Zone. Once principally the playground of the rich and privileged, the IZ now contains the US Embassy to Iraq, and many supporting organizations. These myriad outfits employ some fascinating people. One of my colleagues referred to the constant parade of quizzical looking individuals, all armed in

some fashion, as very much like the "Mois Eisley Cantina" scene in the first Star Wars movie[2]. It really was an apt analogy, as the cast of characters in Baghdad have various reasons for being there, not necessarily well-intentioned, while all the while a light barroom music seems to be playing in the background. The International Zone also has little corporate memory. Almost everybody was there for a relatively short duration. For example: Army personnel were normally on a one year (plus) tour, Navy deployments were usually six months, while the Air Force was expeditionary at four months. Such tour lengths made us NATO folks rather sheepish about admitting that our deployment was only 90 days.

Sandbagged living trailers surround the Presidential Palace, which houses a large part of the Department of State organizations. Behind the palace is Saddam's pool, which still sees a fair amount of use. But even with all these good things, the first mortar attack leaves one wishing for *mortar screens* on top of your trailer to pre-detonate and deflect incoming shells. It's kind of hard to enjoy a cigar while wondering where the next round is going to land, although the risk of both activities seemed appealing to many that come to live and work in the IZ.

Overhead, choppers of different makes and nationalities are in motion during all hours, flying low and fast without lights. Driving in and outside the IZ can be both exhilarating and draining, for adrenaline is a very powerful drug! There are no signals, few signs, and seldom traffic police. Always on the lookout for suspect vehicle-borne IEDs, you share the road with traffic: M1 tanks and Bradleys, humvee convoys, and innumerable SUVs of the Personal Security Details in convoy. You drive fast, and plan how you would "get off the X" when an attack occurs. It's been said that "War is the ultimate competition."[3]

The dynamics of life in the IZ, and particularly with our small crew, had similarities to deployment on submarines, albeit not always as fast moving. The repetitive food choices, how you get to know everyone's stories by the second month, how little nervous tics or personality traits will start to grate on you (or yours on those around you!). Small problems become unnecessarily magnified. Tempers got short when the frequent impacts of attack and all-clear sirens interrupted the routine (somewhat similar to the drills and real events underway.) A thick skin certainly is a valuable character trait to have

during these times. And of course, there's always the counting days 'til redeployment (Army-speak for return to port).

The Task at Hand

NATO came to Iraq to train that country's leaders, and we soon set to work to do just that. I was fortunate enough to be named chief of a team that would provide training at the Iraqi National Joint Operations Center, or NJOC. The NJOC serves as an inter-agency body responsible for taking operational reports from both the Iraqi Ministries of Defense and Interior, and joint command centers in all of Iraq's 18 Governates, or provinces. These reports are analyzed, condensed and fed up to the Prime Minister's situation room, as well as the Iraqi National Security Council. Multi-National Forces-Iraq (MNF-I) also had a cell there, for coordination and combined missions.

NATO's mission to provide training, "separate and distinct" from Coalition efforts, was ideally suited to the NJOC. MNF-I would deal with all operational issues, NATO would provide training. The Iraqis manned two NJOC shifts in a port and starboard rotation, with O5's as shift directors. This group of about 25 individuals was headed up by a two star general, himself a combat veteran—wounded four times. We came to know this group of officers very well over the next three months, as we strove to connect with them, and determine what topics would best benefit their needs. *Understanding Arabs*[4] was an essential book to help us westerners better interact with our training audience. It takes considerable time in the Arab culture to build up a level of trust sufficient to train effectively. We found that pictures of one's family were great to induce animated discussions, in which we were ably assisted by our Arabic-language interpreter, from the NATO country of Romania.

The first team of NTIM-I had set the stage for my group by introducing the concept of the 26-nation alliance providing training. Straining to remember all the Navy Nuclear Power methods of instruction, as well as latter education experiences through National War College, I started to build a program based on: what our predecessors told us, what coalition leaders expressed, and most importantly, what our Iraqi audience felt was required. We started by drawing on our team talents, which collectively included: joint command center

experience, computer skills, intelligence matters, command and control, as well as ground, air, and maritime warfare.

Meeting the Iraqi's urgent request, we started training on basic computer skills. While some NJOC officers already had this knowledge, it was generally not shared. During the previous 35 years under Saddam, information was power, dangerous, and not readily available outside *your lane*. We eventually unearthed a real computer expert from among the NJOC officers—but he was keeping his skills to himself, by habit or inertia. So, *Left click, right click* training was our beginning, from the General on down. This soon blossomed into bi-weekly training sessions until our computer skills were exhausted. It was time to pass that mission on to more knowledgeable professionals better versed in all aspects of computers, as well as Arabic. We eventually convinced the NJOC leadership to use the above mentioned individual's talents for organic training.

As the weeks and subjects rolled by, it came to a point where our team's own skills were about tapped out after topics such as strategic affairs, operational planning, information management, and problem solving techniques. It was time again to look elsewhere—to the other 50 plus members of our Training Mission. Resident in these folks (from 10 different countries) we had more than enough experience and aptitude to bolster our schedule, and audience interest. We brought in many of our colleagues to teach on subjects like civil-military relations, command center development, HF radio operation, Force Protection, and more. One of the secondary benefits was showing the Iraqis how non-commissioned officers are absolutely critical to western militaries, and that officers indeed can learn much from them. This concept was very foreign to our Iraqi friends.

We also strove to ensure that our training was not directive in nature, that is, we did not present it in the manner that this was the only way to solve a problem or deal with complex issues. We presented material as *this works for some NATO nations, perhaps similar methods will work for Iraq*. This concept was borrowed from Lawrence of Arabia, who wrote: "Do not try to do too much with your own hands. Better the Arabs do it tolerably than that you do it perfectly. It is their war, and you are to help them, not to win it for them."[5]

Observations

I drew on many previous leadership lessons, especially when asked to lead people who were older in years, but nominally junior by rank. It reminded me of what Junior Officers must do when leading much more experienced Chief Petty Officers. When leading peers, or more experienced subordinates, one must make a solid plan based on logic and principles that will stand up to criticism, plus be effective in execution. Also, the method of *leadership by negation*, proved to be very effective in standing up the nascent NTIM-I. Navy leaders are often expected to forge ahead with a set of rules telling us *what not to do*, thereby giving freedom of maneuver to reach a goal. In a place where the rules haven't even been spoken, much less written, being comfortable with this style goes further than *leadership by direction*—that is, tell me *what to do, otherwise I do nothing*.

The instruction methods ingrained from years of submarine service, as well as running multiple training programs as CO of a Reserve Center, were put to good use in setting up and executing NJOC training. One key was looking for *objective quality evidence* that the education was being internalized. Examples of this were when the Iraqis started doing real-time monitoring of open sources (internet, TV) for Intel and battle damage assessment, or when they incorporated operational planning techniques in follow-on events. Also, you could tell by the scope of their questions and terms used that the Iraqis were building on past lessons.

Joint Military Professional Education provided the foundation and familiarity with our sister services: operations, terms, and culture so necessary to be successful on a joint/multinational mission. A previous Joint tour taught this sailor about deploying to a land battlespace where there were few set rules and a lot of autonomy for reaching an objective. Finally, the National War College curriculum plus classmates' earlier Iraq experiences, helped shape my thinking for the multicultural and interagency setting that was Baghdad in the fall of 2004. While this deployment experience was only one small part of a much larger campaign in Iraq, it offers a lens through which to view what a Baghdad deployment is really like, and to better prepare personnel for what lies on the horizon. For in the future, some sailors will be seeing more sand than sea.■

ENDNOTES

1. B. W. Tuckman. "Development Sequence in Small Groups." Psychological Bulletin, 1965, Vol. 63, No. 6, pp. 284-399.
2. George Lucas. Star Wars. (Hertfordshire, England: Elstree Studios, 1977.)
3. Dr. John Chin, during motivational speech in Baghdad to MNF-I and NATO troops, Oct 2004.
4. Margaret K. (Omar) Nydell. *Understanding Arabs: A guide for Westerners, 3rd Edition*. (Yarmouth, Maine: Intercultural Press, 2004).
5. T.E. Lawrence. "Twenty-Seven Articles." *Arab Bulletin*, 20 August 1917, Art. 15. Http://www.lib.byu.edu/~rdh/wwi/1917/27arts.html

NSMRL
A SMALL COMMAND WITH A HUGE PRESENCE FOR THE SUBMARINE FORCE

by CAPT J. Christopher Daniel, MC, USN
and Dr. Jerry Lamb

"To protect the health and enhance the performance of our warfighters through focused submarine, diving and surface research solutions" is the mission of the Naval Submarine Medical Research Laboratory, located just a few hundred yards from the waterfront at Submarine Base New London, Groton, CT. One of 10 Navy Medicine Biomedical Research Labs around the world, it has directly supported Naval Submarine Forces since World War II. Yet, like the submariners we support, the majority of our past contributions, as well as our current work, is virtually unknown to those outside of the submarine community. In fact, even on our own base, we are not well known - NSMRL is frequently confused with the Naval Undersea Medical Institute (NUMI). Thus, to educate the broader community, this paper will describe some of the highlights of NSMRL's proud history and discuss some of our current activities.

History

"The medical problems peculiar to submarines arise from unfavorable changes in habitability which may occur, chiefly in combat. The most important of these are excess heat and humidity, the accumulation of carbon dioxide, and the depletion of oxygen from the air under certain conditions. That only 31 patrols in World War II were interrupted or terminated because of these or other deficiencies of habitability speaks well for the progress which was made in the control of these problems. Until these deficiencies have been completely overcome, they will continue to be a limiting factor in submarine operations (Shilling and Kohl, 1947). [1]

What was eventually to become NSMRL started in 1942 as a two-man Medical Research Section of the base dispensary at U.S. Submarine Base, New London, with the mission of providing "answers to problems in communications, vision, personnel selection, and environmental medicine which resulted from wartime demands on

the Submarine Force."[2] The working spaces were "an office, a soundproof testing room, and one large classroom and/or examining room in the south wing of the dispensary, Building 86."[3] LCDR Charles W. Shilling, MC, USN, the submarine medical examiner assigned at the time to the escape training tank (and also responsible for selecting Navy and Coast Guard personnel to be trained by the Naval Submarine School), along with Chief Pharmacist's Mate Ira A. Everley, "a submarine man of long experience,"[4] had initiated research in 1939 on submarine sound problems. They published a series of articles entitled Auditory Acuity among Submarine Personnel in the Naval Medical Bulletin in January, April, July and October of 1942. Some of this initial work led to the development of tests and techniques to select men for sound listening duties on submarines, which appeared as Medical Research Laboratory Report No. 1, The Development of Methods for the Selection of Sound Listening Personnel. Soon, studies on night vision, color vision, and lookout training were begun, and within a year, the initial staff was augmented with a Psychologist-Statistician (William D. Neff, Ph.D.) and a Secretary-Statistician (Mrs. Jessie W. Kohl) from the National Defense Research Committee (NDRC), along with various TAD personnel. In addition, through the assistance of the National Research Council and the NDRC, the lab enjoyed extremely active and productive collaborations with civilian scientists from numerous universities and other institutions.

By the end of World War II, the staff of what had become (in March 1944) the Medical Research Department of the base included 26 officers, 57 enlisted, 11 WAVES and 4 civilians. As a result of demobilization following the war, however, the lab's personnel quickly became predominantly civilian. On 30 June 1946, 7 officers, 24 enlisted and 40 civilians became plank-owners of the new Medical Research Laboratory—a separate activity of the Bureau of Medicine and Surgery, with now-CAPT Charles Shilling, MC, USN, the first Officer-in-Charge. Its mission was three-fold: selection of personnel for training in the Naval Submarine School, instruction of hospital corpsmen and medical officers in Submarine Medicine, and research in medical aspects of submarine and diving including night and color vision, human engineering, and personnel selection methods.[5] The activity became part of the new Naval Submarine Medical Center in

1964, but since 1974 has functioned as a separate command under its present name, the Naval Submarine Medical Research Laboratory (NSMRL). In 2005, NSMRL remains responsible for screening candidates for the Submarine School and for focused submarine and diving research, while NUMI, established as a separate command in 1973, continues the mission of submarine medical officer and enlisted training.

The laboratory now occupies three buildings on Upper Base, just east of the present Dental Clinic and just west of Rock Lake. It has evolved technologically to include a specially constructed 42,000 cubic foot anechoic soundproof chamber for acoustic discrimination and directional processing work, numerous sound and vision testing booths, a small hyperbaric chamber for instrument testing, and two multi-person man-rated hyperbaric chambers, one of which is capable of high altitude operations to simulate *flying after diving*. This latter chamber was the site of the Genesis 1 experiments conducted in the late 1950s and early 1960s by Drs. George Bond and Robert Workman, who envisioned that men could live and work in habitats on the floor of the ocean. These experiments explored the feasibility of saturation diving, confirmed the suitability of helium-oxygen breathing mixtures, and ultimately resulted in their landmark 1963 study, which reported "that men could live/work in a hyperbaric chamber at 200 feet for two weeks with no untoward consequences. These studies culminated in 1964 in an operational phase, Sea Lab 1, a habitat located 200 ft in the open ocean near Bermuda."[6]

NSMRL's historical accomplishments and contributions to the Submarine Force and to our nation's defense are too voluminous to catalogue here. However, we will highlight a few from earlier decades before discussing our present work. In 1951, NSMRL proved that performance was not affected adversely when men had visual acuity of less than 20/20, leading to a relaxation of the standard to 20/30.[7] Subsequent work in the 70's and 80's resulted in a modification to periscope eye guards to allow the insertion of a refractive correction into the periscope optics.[8] These accomplishments allowed a significant enlargement of the pool of potential submariners without compromising the submarine mission. In 1960, NSMRL's psychological research aboard USS TRITON as it circumnavigated the globe resulted in the establishment of the mission duration for SSBNs.

Between 1977 and 1979, NSMRL "prepared or implemented programs for the diagnosis of 56 common and acute diseases…on several mini and microcomputers ….for use by corpsmen aboard submarines."[9] In addition to the Genesis/SEALAB underwater habitat work, other critical areas in which NSMRL has made a huge operational and scientific impact during its proud history include research: proving that submariners can tolerate and perform well in an atmosphere with elevated carbon dioxide and low oxygen levels, the replacement of *rig for red* viewing in sonar and control rooms with low level white lighting,[10] development of both the International Orange color (air-sea rescue red) for visibility and the Farnsworth Color Lantern Color Vision screening test, studies of nitrogen narcosis, and development of many of the U.S. Navy saturation diving and decompression tables in use today.[11]

Current Challenges

The January 2005 mishap of USS SAN FRANCISCO (SSN 711) reinforced the importance and the impact of NSMRL's efforts in the area of Survival and Escape from Disabled Submarines (DISSUBs). NSMRL is an integral member of COMNAVSUBFOR's Submarine Escape and Rescue Review Group, and is responsible on an ongoing basis for revisions to the Disabled Submarine Survival Guide, the Guard Book. NSMRL's work in this area over the last decade has contributed to the deployment of numerous technological advances in use today, such as Submarine Escape Immersion Equipment (SEIE) suits, PDA-based analytic software to facilitate Senior Survivor time-remaining determinations (SERCIL—Submarine Escape and Rescue Calculator and Information Library), portable gas analyzers and CO_2 scrubbing "Battelle Curtains." In related work, Lab staff is exploring the possibility of escape from depths greater than 600 feet. Additionally, NSMRL is currently evaluating stretcher designs for use on submarines and testing escape and rescue streamers to enhance recognition of DISSUB survivors at sea. In the area of onboard medical treatment, the Lab has recently made specific recommendations regarding the availability of oxygen dedicated for medical use onboard submarines.

To evaluate DISSUB equipment and procedures, the Lab worked

with Submarine Squadron Five to conduct SURVIVEX 03 (March 2003) and SURVIVEX 04 (December 2004) on USS DALLAS and USS SALT LAKE CITY, respectively. These exercises confirmed the ability of the aforementioned CO_2 scrubbing curtains and the use of oxygen release to control the atmosphere during DISSUB conditions. Other DISSUB procedures and equipment were also evaluated, including survival rations and emergency lighting options. As a result of the SURVIVEX research, a new challenge has emerged—to mitigate the increase in ambient temperatures and resultant heat injury risk that occurred in both exercises. This was an unexpected finding—it had been expected instead that a DISSUB would encounter lower temperatures, increasing the risk of hypothermia.

NSMRL's work on submarine survival and escape is simply one facet of its efforts in the area of crew health and safety. The challenges posed by the submarine's unique environment and operating conditions place a premium on having a healthy and fit crew. The submarine atmosphere, for example, must be maintained and evaluated to ensure that it does not pose a potential hazard to the crew. As is well-known, there are automated systems to measure oxygen and CO_2 levels, as well as the concentrations of a few other compounds and elements, but the recycled nature of the atmosphere means that possible contaminants must be monitored on a long-term basis. Even normal items, such as paint, can give off harmful gases. The Submarine Atmosphere Health Assessment Program (SAHAP) addresses these issues. SAHAP has developed wafer-like sensors that measure the level of various possible contaminants during the course of a deployment. On return of the boat, the wafers are removed and analyzed, and the results reported to the boat. Since submarine sailors are continually in a closed environment, limits need to be set well below comparable OSHA standards for shore workplace environments. The Closed Living Space Environmental Concerns Working Group, another Navy-wide organization in which NSMRL plays a key role, determines acceptable limits for these contaminants. The ongoing measurements are supplemented by analyzing more compounds during sea trials; techniques include utilizing vacuum bottles to draw air samples over a brief time. USS VIRGINIA, lead ship of a new class, will have her atmosphere tested during sea trials this summer to ensure that its new equipment and products pose no unusual problems.

Another unique aspect of the submerged submarine is the absence of sunlight. This can possibly lead to Vitamin D deficiencies during prolonged submergence. NSMRL has studied the effects and potential remedies. The natural solution, liberty in a tropical port, is often not possible; an alternative remedy may be as simple as periodic large doses of Vitamin D.

Another issue, not unique to submarines, is exposure to continuous low-level noise. Noise Induced Hearing Loss (NIHL) is the Veterans Administration's largest bill for service-related disabilities. To improve Sailor self-motivation to practice hearing conservation shipboard, NSMRL is developing a hearing loss simulator for the Office of Naval Research, to be used to demonstrate what the future will sound like to a Sailor who doesn't use hearing protection. It does not simply turn down the level, but shapes the frequencies according to the type of hearing loss that the Sailor has begun to experience. Knowing that you will not be able to understand phone conversations or appreciate music can be a powerful motivation to change behavior.

Early prediction of future hearing loss is also being studied at NSMRL, using Otoacoustic Emissions, minute sounds that the ear produces in response to external sound stimuli. Research conducted on aircraft carrier crewmembers provides early evidence that this technique may be able to indicate future hearing loss. If confirmed, the Navy would be able to provide hearing protection targeted to specific individuals, or to place them in a less hazardous watchstation. This technology could be particularly valuable for the Submariner, who is in a continuous low-level noise environment 24/7 while underway.

In the unforgiving undersea environment, 24/7 operations require a rested and alert crew. Normally, humans have a daily cycle of wakefulness and sleep, the Circadian Rhythm (CR), which is driven by the sun's passage. Submerged Sailors have no daily light clues to stabilize their CR. The current watch cycle of 6 hours on watch and 12 off often leads to a destabilized, free running CR, and the possibility of standing watch at a low point in the sleep/wakefulness cycle. Because the *day* is only 18 hours long, the CR pattern is constantly shifting, causing further loss of alertness—the equivalent of flying eastward through six time zones every 18 hours. NSMRL has been studying how new watch schedules that more closely follow a normal 24-hour day might work. Any potential change must not only help

with the CR patterns for increased alertness, but must also accommodate all of the boat's operational requirements. A recent sea trial of an 8/16 schedule was conducted on USS MARYLAND (SSBN 738) with behavioral, physiological, and psychological measurements. While the data are still being analyzed, initial indications suggest that it improved overall alertness. As important perhaps was the crewmembers' reaction; they thought that it was much better—and that it didn't adversely impact their normal routine, operations, or drills.

Since the human element is the most important system on the boat, sailors selected for submarine duty, all volunteers, must meet high standards to be accepted. NSMRL has been evaluating suitability for submarine service since its inception; it is now mandated in the Navy's Medical Manual. Since 1986, NSMRL has been using a self-report psychological test, SUBSCREEN, to assess factors such as claustrophobia, suicidal ideation, depression, etc. Sailors who flag high on one of these factors are referred to the base clinic for psychological evaluation. Based on recommendations from this screening and evaluation, Submarine School command personnel make the decision to retain or release the individual. About 3 percent of the students are taken out of the force, saving both money and time. However, there are still a number of those remaining who are unsuccessful in their Navy career. They attrite for negative causes, are not promoted and don't finish their first enlistment. Using the database of 30,000 former and current Submariners, NSMRL determined that a subset of the SUBSCREEN test could predict which people were more likely to fall into the unsuccessful category. That information is now being used to see if early intervention during Sub School can help prevent this attrition.

The outcome of all the screening and health efforts is to assure that the Submarine Force has capable, high performing crews. NSMRL is also deeply involved with helping Sailors perform more effectively by working on ways to facilitate the many submarine missions.

With the Global War On Terrorism (GWOT), the submarine mission has once again become focused on Intelligence, Surveillance, and Reconnaissance (ISR), sometimes involving Special Operations Forces (SOF). In fact, Virginia class and the new SSGN, a conversion of former Trident SSBN's, both had insertion of SOF as a primary consideration. NSMRL has been involved with divers and diver functioning since Dr. Bond's original SEALAB work. NSMRL is

currently working on diver safety and guidance as well as operational issues.

Waterborne noise is a potential hazard to divers working with tools or nearby active sonar. Based on efforts during the recovery of USS MONITOR turret and USS ARIZONA preservation, NSMRL has developed a portable noise meter for Fleet use. Combined with guidance developed from years of measuring the effects of sound on the diver's physiological state, NSMRL constantly provides the Fleet with timely and accurate parameters for working with underwater tools. The same sonar bioeffects research is being used operationally in two ways. First, it is being used to test safety parameters for divers operating near the newly deployed SURTASS LFA sonar. Second, the inverse of protection is deterrence. NSMRL is the Navy and Coast Guard's lead for determining the potential physiological impacts of proposed diver deterrence systems. The years of developing techniques and conducting research on these factors will pay off in increased Submarine Force Protection. NSMRL's work with submarine SOF operations includes lockout procedures, diver recall, and diver communications as well as improved procedures and equipment.

All submarine missions, including SOF insertion, still call for the types of systems and procedures developed for obtaining and maintaining *situational superiority* at all times. This depends ultimately on command decision-making, a key focus area within Submarine Force Headquarters. NSMRL has studied situational awareness among submarine officers and is now working with Submarine Development Squadron 12 on projects to improve overall naturalistic decision making processes. The way to best display information for this type of decision making may be very different, since it requires rapid integration of multiple inputs to maintain situational awareness. One example is the problem of coming to periscope depth in a multi-contact environment. NSMRL has addressed this in two ways. One, the Lab has developed, in conjunction with the Naval Undersea Warfare Center Newport Division, a unique signal processing and display technique for collision avoidance. It takes advantage of the human's binaural capability to compare different sounds in each ear. This approach, similar to the *cocktail party* effect that allows you to hear your name when it is mentioned in a noisy room, improves target detection by almost 7 dB, more than doubling the distance at which a contact can be acquired. Secondly, NSMRL and NAVSEA engineers

have developed new noise canceling headphones to allow sonar operators to hear acoustic sounds much more clearly.

NSMRL in 2005 and Beyond

"Submarine life consists of a unique combination of environmental stressors. Submarine crews experience prolonged periods of time in a confined space underwater. Since the advent of the nuclear-powered submarine 50 years ago, the near total self-sufficiency of the submarine to create and purify its own atmosphere, distill water, and maintain climate control has increased submerged times far beyond those of its air-breathing diesel counterpart. Crewmembers work in the absence of day-night cues, and under conditions of disrupted sleep-wake cycles, sleep deprivation, varying noise levels, and atmospheric composition and pressure constraints. Most constraining, however, is the lack of habitable space – the person-to-space ratio is one of the highest in any extreme environment (Shobe, et.al., 2005).[12]

In the early years of the 21st century, NSMRL is as engaged in supporting the Submarine Force as it was at its inception. The challenges to submariners noted by CAPT Shilling and Mrs. Kohl in 1947 still pertain. NSMRL continues to excel in operationally relevant work on undersea sound and personnel selection issues; its efforts now include additional areas such as escape and survival, atmospheric monitoring, and crew performance. For these many years of achievements, NSMRL recently received its first Meritorious Unit Commendation, and has been recognized as DOD's First Choice for Undersea Biomedical Research. As leaders of a lean but amazingly dedicated, innovative and productive group of researchers and support personnel, we have great confidence in Naval Submarine Medical Research Laboratory to continue the proud tradition that is our heritage. As we like to say, NSMRL does not make the Submarine… but it makes the Submarine Better. Pride Runs Deep at NSMRL!■

ENDNOTES

1. C.W. Shilling and J.W. Kohl, History of Submarine Medicine in World War II (Medical Research Laboratory, U.S. Naval Submarine Base New London, Report No. 112), 1947, p. 182.
2. Command Historical Report (OPNAV Report 5750.1), Naval Submarine medical Research Laboratory (NSMRL), 1987, p. 2.
3. Shilling and Kohl, 1947, p. 254.
4. Ibid, p. 253.

5. Command Historical Report, 1987, p. 2-3.
6. NSMRL "Bond" Chamber, from *Hyperbaric Medicine Today* 2001 Calendar, February page.
7. J.K. Herman, "Lab for the Silent Service," *U.S. Navy Medicine*, November 1981, p. 11.
8. Command Historical Report, 1987, p. 4.
9. Herman, 1981, p. 11.
10. Command Historical Report, 1987, p. 4.
11. An excellent summary of some of the lab's more recent accomplishments is Dr. Jerry Lamb and Joe DiRenzo's article, "A Little-Known Lab Makes a Big Impact," *Undersea Warfare*, Winter 2004.
12. K.K. Shobe, P. Benton, M. Bing, L. Crepeau, C. Duplessis, J. Dyche, D. Fothergill, W. Horn, J. Lamb, A. Quatroche and D.E. Watenpaugh, "Environmental, Physiological, and Psychological Challenges of Submarine Life," presented at The Society for Human Performance in Extreme Environments annual meeting, Janaury 2005.

SUBMARINE NEWS FROM AROUND THE WORLD

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From the April 2005 Issue

UNITED STATES—Cuts in the ASDS Program

In April 2005, the Department of Defense released the Selected Acquisition Report December 2004, which indicates that the US Navy's (USN) Advanced SEAL Delivery System (ASDS) program is the subject of budget cuts. Program funding has decreased by US$755.7M, from US$1.9B to US$1.2B. This is in large part from the total requirement of six units being reduced to three. The exact reason for the reduction in the total procurement of ASDS units is not known at this time. However, that the ASDS program is years behind schedule and hundreds of millions of dollars over budget must be considered contributing factors.

Northrop Grumman received an initial contract in September 1994 for US$69.8M to design and build the first ASDS prototype, with an option for five more vehicles. Initial estimated unit production cost for follow-on vehicles was US$30-35M per unit, however, by mid-1999 the protoype vehicle cost had increased to US$169.6M. It is now estimated that the follow on units could cost as much as US$125M per unit.

Originally, the first ASDS was scheduled to be delivered in August 1997. Four years behind schedule and US$210M over budget, the first ASDS was conditionally delivered to the US Navy in August 2001. The delay in delivery and cost overruns was in part due to the fact that during the construction of the ASDS, requirements for the boat became more technical, and the design became more complex, thus increasing the cost and pushing back the scheduled delivery date. The ASDS was finally turned over to the Navy in June 2003 after successfully passing its operational evaluation.

Defense authorization conferees have approved US$23.6M for the procurement of a second ASDS in FY06, however, they stated that none of the funds shall be used until the Secretary of Defense notifies the defense committees in writing of a favorable milestone C decision. A milestone C decision was initially planned for June 2003, but with

concerns over battery life, sub survivability, propeller noise, as well as life support systems, a milestone C decision is not expected until December 2005. While a third ASDS may eventually be funded, no date has been set, and may be subject to cancellation as well.

Of note, in March 2003, the General Accounting Office (GAO) released a report stating that the ASDS program needed increased oversight. Sighting cost overruns, technical problems with the sub, and the fact that the ASDS program is years behind schedule, the GAO report suggested canceling the ASDS program and re-opening the bidding to other contractors. The Navy rejected the GAO's proposal on re-opening the bidding process for ASDS. However, the Navy has urged Northrop Grumman to seek partnerships in order to get the program back on schedule and to reduce overall costs.

Although the ASDS program has not been cancelled, the three-unit reduction in the program could be the Navy's way of meeting the GAO's suggestion half way. Instead of canceling the ASDS program altogether, the Navy may take the approach of procuring up to two additional ASDS units, followed by a re-bid for additional units after all the discrepancies have been worked out of the first three units.

GERMANY—Finding Homes for the Type 206A Submarines

Reporting of mid-April 2005 suggests that the German Government has offered to sell Indonesia some of its submarines under a counter-trade scheme. Although the types of submarines have not been released to the public, the Type 206A submarines are more than likely the class being discussed. Germany still has eleven Type 206A submarines in service, however, the entire class will be decommissioned by the next decade as the Submarine Force is downsized from its current level of 12 units down to six by 2015. The first units are becoming available now as the Type 212A submarines are beginning to enter service.

With this in mind, one must ask where will the Type 206A fleet go? It appears that on 12 December 2004 Germany offered two units to Egypt in order to help replace the aging Romeo fleet. Now with the offer to Indonesia, it appears that the German Government is actively marketing the Type 206A fleet. AMI believes that there are several candidates that could take over the Type 206As if offered from the German Government. Options include:

- Egypt – Two already offered, however, could grow to four units as the Egyptian Navy is trying to replace its entire Chinese-built Romeo force and has had no success in trying to acquire new submarines from the USA.
- Indonesia – Apparently offered several submarines, probably two as the Indonesian Navy has an immediate requirement for two additional submarines to supplement its two Type 209s currently in service. However, this deal will have to be pretty attractive as Indonesia has apparently been offered the much more modern South Korean Chang Bogo (Type 209) class built in the 1990s. Indonesia is also involved in a large-scale amphibious acquisition program (Tanjung Dalpele class LPD) with the South Koreans as well as other naval modernization efforts.
- Thailand – An on again off again program for submarines strictly depends on the navy chief. Currently, in the off again mode, however, for the right terms the Royal Thai Navy (RTN) may reenter the submarine business. Again we stress the right terms as the sea service is currently procuring two Chinese-built OPVs and is apparently close to agreement for the purchase of two new corvette/frigates from the British. These two surface programs are utilizing the majority of procurement funding for the RTN and other government sources. If the RTN would reacquire a Submarine Force, it would be no larger than three units.
- Romania – Still in the submarine business, could take one of the units if the terms were right. Although a Submarine Force is no longer mentioned in Romania's defense documents, it still utilizes the single Kilo class for training and continues to delay its modernization. If Romania decides to stay in the submarine business and not modernize the Kilo, it could be a candidate for a single Type 206A.
- Bulgaria – Also still in the submarine business with one Romeo class. Similar to Romania, the Bulgarian Navy is still maintaining its last unit. Additionally, in 2004, the sea service had apparently inquired with the Danish Government concerning one of the Tumerlen class, although the deal has not materialized. Bulgaria could also procure one unit if it decides to stay in the submarine business.

SINGAPORE—Growing the Submarine Force

In mid-May 2005, AMI received information that the Republic of Singapore Navy (RSN) is discussing with the Swedish Navy about the procurement of Sweden's final two VASTERGOTLAND (A17) class submarines when they decommission. These two submarines would supplement the RSN's four Challenger class (former Swedish Sjoormen-A12) that were procured from Sweden in the late 1990s (a fifth unit was procured but used for spare parts only).

Sweden will probably decommission the final two units (VASTERGOTLAND and HALSINGLAND) in late 2005 or early 2006 in order to meet the reduced Submarine Force level prescribed in Defense Resolution of 2004. The submarines would be overhauled and modernized in Sweden prior to delivery to Singapore, very similar to the transfer process that took place with the four Sjoormen class when they were transferred to Singapore beginning in the late 1990s. An important but open question is whether they would be outfitted with air-independent propulsion (AIP) like the others of the A-17 class SODERMANLAND and OSTERGOTLAND recently received. There is a strong argument to modernize at least one of them with AIP so that they could commence evaluating and gaining experience with it before deciding on their future submarine.

Singapore apparently has been very satisfied with the Sjoormen class since the master plan for the RSN was to operate used submarines first on a trial basis and only if successful, would it consider procuring the next generation submarine and maintain a Submarine Force. With the decision to acquire two more submarines, it is clear that RSN has decided that submarines are now an integral part of the fleet. Further with six total active units, the RSN could operate its force in the standard rotation of having two vessels operational, with two in the maintenance cycle and two in the training cycle. This procurement deepens their ties with Sweden and would appear to improve the chances for a viable Viking project.

IRAN—Mini-Subs in the Pipeline

On 11 May 2005, Iran officially announced the production of the country's first indigenously produced submarine. The Ghadir (IS 120) class mini-sub is of similar design to the North Korean P-4 class submarine. In the mid-1980s North Korea exported at least one unit to

Iran, which could be the basis for the new construction units currently being built.

Iranian defense ministry spokesman Mohammad Imani was quoted as saying, "the enemy would not be able to detect his submarine." At approximately 20 meters in length (65.6 ft) and displacing around 110 tons submerged, the mini-submarine would be hard to detect in the shallow Arabian Gulf. Reportedly able to launch both torpedoes and missiles, the Ghadir class is likely equipped with two similar tubes as the P-4 class (406mm) thus limiting the number, size and range of any weapons it is capable of carrying.

It is not likely Iran is building these submarines in large numbers, but even a few of these stealthy weapons could disrupt shipping through the Strait of Hormuz and must be considered a threat to the region.

It must be advised that the program name of Ghadir is sometimes spelled as Qadir and is also referenced as part of the follow-up program to the Al-Sabiha 15 class swimmer delivery vehicle (SDV). The Al-Sabiha class SDV program was terminated at three units in favor of three units of the Qadir class. Naval program names, ship classes and ship type identifications are frequently misidentified in the press in order to add confusion to Iran's potential adversaries.

From the June 2005 issue

TURKEY—AIP SUBMARINE

Turkey's plan to acquire four Air Independent Propulsion (AIP) capable submarines to replace the four oldest units of the Atilay class appears to be solidified. Under the ten-year plan the SSM approved the acquisition of up to four submarines in two batches with a total cost estimated at US$1B. Although the contract date was not publicly released, it appears to be on schedule with Turkish Navy plans that call for a construction contract by around 2010 followed by commissioning in 2014. This schedule would seem to fit the sea services procurement budget with corvettes contracted by the end of 2005 followed by a single LPD in the 2006 or 2007 timeframe.

If funding is constrained due to other obligations, the contract date could in fact slip to around 2012 with the first unit entering service by 2016. Regardless of the timeline, the AIP submarine procurement is

expected to be financed by foreign state loans guaranteed by the Turkish Treasury.

SUBMARINE RESCUE VESSEL

In the latest-ten-year procurement plan, the SSM announced that one Deep Sea Rescue Vessel (auxiliary ship) would be procured during the decade. This program is in the very early stages and no firm dates are currently available for the program. With funding expected to be tied up for the foreseeable future with the MILGEM Corvettes, LPD, and AIP submarines, this vessel may not be funded until the end of the ten-year window around 2016.

Considering a 2016 construction contract date, an RfP could be expected to be released by around 2014. Like most Turkish Navy programs, it can be anticipated that the new auxiliary will be built in Turkey with design and construction assistance by a foreign supplier.

ATILAY CLASS SUBMARINE MODERNIZATION

The Turkish Navy is expected to initiate talks with Germany's Howaldtswerke-Deutsch Werft (HDW) by early 2006 regarding the modernization of four units (*Wildfire*, *Betray*, *Dogbane* and *Delaney*) of the Aitlay class submarine. The sea service estimates that the modernization program will cost around US$200M and will include the upgrade of the weapons and fire control systems, overhaul of diesel engines and electric motors, replacement of batteries, and the upgrade of the sonar suite and towed array. The modernization is expected to take place at the Golcuk Naval Shipyard. The modernization is expected to be financed by foreign state loans guaranteed by the Turkish Treasury.

The sea services current plan is to utilize HDW as a single source for the modernization unless negotiations fail, at which time the SSM will open an international tender for the program. The modernization of the first unit is expected to start no later than early 2007.

INDIA—Rebid for Project 75 Submarines?

The Indian Armaris Scorpene submarine deal has in fact been put on hold by the Indian Ministry of Defense. It appears that Howaldtswerke-Deutsche Werft (HDW) has entered the fray by offering the Type 214 design to the Indian Navy as an alternative to the Armaris Scorpene. On 04 March 2005 HDW was removed from

a blacklist that it had been on since questions arose on the Type 209 deal concluded with the Indian Navy in the late 1980s. It was exonerated of all wrong doing by a Delhi High Court. This cleared the way for the company to re-enter the competition for Project 75.

Indian Cabinet approval on the Scorpene deal has been in a holding pattern since 2003. A final approval was expected by the Indian Government Cabinet in early 2005 in what was to have been the last step in the Indian Navy/Armaris deal for the procurement of 6 (and possibly up to 12) Scorpene submarines built in India. The majority of the small details in the Indian Navy/Armaris deal had apparently been worked out with the price tag of US$1.8B for the construction of the first six Scorpene Class submarines at India's Mazagon Dock Ltd (MDL).

Reporting indicates that when the Indian Navy began the submarine program in 1998. HDW was not considered a viable candidate as the company was blacklisted. With HDW blacklisted, the Armaris scorpene design became the frontrunner in a non-competitive process, with the program maturing to the brink of Indian Cabinet approval.

With the favorable ruling for HDW, HDW is now working on an offer for the Type 214 design for the Indian Navy, which is expected in the next few months. Similar to the Scorpene deal, HDW is willing to build the submarine in India under a licensed production agreement as well as provide all transfer technology arrangements as necessary.

The Indian Navy will probably now re-bid the program likely delaying any decision until 2006. In head to head competition HDW may have the upper hand. HDW and India have a working relationship through the HDW Type 209 program. India also has two distinct supply lines for submarines, one with Russia and one with Germany. To move forward with the Scorpene would mean a third logistic chain, one that the Indian Navy may avoid now that is has an option for additional German submarines (as well as systems and weapons). Thirdly, if the Indian Navy elects to utilize Air Independent Propulsion (AIP) at a later date, it wouldn't be using the same system as Pakistan (MESMA), reducing a potential security risk.

CHINA—Additional Kilo (Project 636) Submarines

Information received by AMI in mid-June 2005 indicates that the Peoples Liberation Army—Navy (PLAN) may be interested in

additional Russian Kilo (Project 636) class submarines. Currently, the PLAN has six Kilo class submarines (two Project 877 EKM and four Project 636) in service and five additional units on order with deliveries expected through 2007. It is thought that the PLAN is already in negotiations for the additional units beyond the twelve they have purchased.

Reporting indicates that acquisition of additional units of the Kilo class is tied to the procurement of the Novator SS—27 3M54E1 (Klub) surface-to-surface missile (SSM), which the PLAN has been attempting to acquire in large numbers for its submarine fleet. Industry sources suggest that Russia will not allow the sale of the Klub missiles without commitment by the PLAN for additional units of the Kilo class. This has been typical of Russian practice in order to maximize its export potential, tying various sales together in a package.

Although the number of units for the next batch has not been determined, the PLAN may order up to eight additional units as the sea service works at replacing large numbers of the Ming class that were commissioned in the 1970s and 1980s and as well as the Romeo class submarines that were commissioned from the 1960s through the 1980s. This replacement program will certainly not be on a one-to-one basis.

With the Kilo (project 636) line staying open, the PLAN continues to move forward with its tradition of running three diesel-attack submarine lines, two domestic (Yuan and Song classes) lines in order to develop the indigenous capability while still relying on the Russian-produced Kilo class in order to receive the numbers of modern units in a timely manner.

CHINA—Type 094 Submarine Launches SLBM

On 16 June 2005, the Peoples Liberation Army-Navy (PLAN) test-fired a ballistic missile from what is believed to be a Type-094 Jin class SSBN that was launched in December 2004. The missile was launched from the submerged vessel located south of Taiwan and flew approximately 3,862 kilometers (2,300 miles) to a target point in the Xinjiang Desert. The test was a success.

The submarine launched ballistic missile (SLBM), designated Ju Lang-2 (JL-2), is a navalized version of the Dong Feng-31 ICBM that has a range of about 8,000 kilometers (4,960 miles) and contains three independent re-entry vehicles (warheads). The JL-2 was originally

fitted into the Type 031 (Golf) class SSB in 1995 and had its first successful test firing in 2001.

With the successful implementation of the JL-2 onboard the Type-094, China now possesses a weapon capable of reaching any target in the world. When loaded to capacity with JL-2 missiles, the Type-094 would contain 48 separate 90-kiloton warheads.

It is not currently known whether the JL-2 is ready for full-scale deployment but according to a report issued by the Pentagon regarding China's nuclear forces in May 2004, the number of SLBMs could increase to 30 by next year and 60 by 2010. It is unknown how many SLBMs will be JL-2s but as the Type-094 class becomes operational, it is likely that emphasis will be placed on equipping them due to their greater strategic deterrence ability.■

SOME LESSONS TO BE LEARNED

THE FIRST LANDING

by CDR David R. Hinkle, USN(Ret)

Conning a submarine into port and alongside a pier is one of the basic requirements for an officer qualifying in submarines. My first landing is as fresh in my mind as if it were just yesterday—not 48 years ago this December. It was a traumatic experience that changed my life.

In July 1956, I completed Basic Submarine School and reported aboard the World War II submarine USS CAVALLA. CAVALLA was a diesel-electric, thin skin, GATO class submarine. CAVALLA's claim to fame was sinking the Japanese heavy aircraft carrier SHOKAKU, one of the four carriers that attacked Pearl Harbor on 7 December 1941. Mothballed after World War II, she was converted to an Anti-Submarine Warfare Hunter-Killer in 1953. Her guns were removed and the topside streamlined for better submerged operations. The fleet type bow was removed and replaced with a large low-frequency sonar array. On the first landing after I reported aboard CAVALLA, barely moving, touched the pier bow first. A wooden fender dimpled the thin steel plate covering the sonar array and broke four very expensive hydrophones. Damage to a naval ship requires the convening of an official Naval Board of Inquiry with the Captain and Officer of the Deck designated as interested parties. A formal investigation and hearing is conducted. It is not a pleasant experience even if found innocent of any negligence or fault. Needless to say that landing made a lasting impression on me.

In the normal course of events I would have had a significant work-up prior to making my first landing. Young officers had ample opportunities to learn shiphandling because most submarines conducted daily operations in local Op Areas. The Thames was a bustling river in the 1950's. Every morning a score of submarines, destroyers, patrol craft, and retrievers steamed down river to local Operating Areas in Long Island Sound. CAVALLA's test depth was only 300 feet so there was ample depth of water in Long Island Sound for all submarine operations. Subschool students learn to dive and surface submarines. Approach officers attacked and evaded the destroyers and patrol craft. Retrievers picked up the exercise torpedoes. Qualifying

officers like myself conducted man overboard and shiphandling drills. The destroyers and patrol craft even dropped live depth charges—at a safe distance—for training and to indoctrinate submarine crews. I can remember light bulbs bursting, hull insulation breaking loose, lockers popping open; improperly stored gear tumbling out of cubby holes. The young sailors thought it was a lark. The WWII veterans hated it. In the afternoon there was a long procession of ships and boats back up river in time for cocktails at the O Club. Junior officers had multiple opportunities to conn the ship in and out of port.

But the Cold War intervened. CAVALLA was a "K" boat assigned to the Submarine Development Group and we were at sea almost continuously. CAVALLA only made 4 landings in the first 5 months I was on board, one each in New London, Bermuda, St. Johns, Newfoundland, and Portsmouth, England. The Captain made them all.

The Watchstanding Officers were very concerned about my not having the opportunity to conn the boat into port because until I made a satisfactory landing I was ineligible to stand Inport Duty Officer watches. The Inport Duty Officer had to supervise battery charges done at night as well as frequent tours of all spaces to ensure safety of the ship. Thus, every 3 or 4 days, depending on the number of qualified officers, the Inport Duty Officer worked 24 hours, perhaps getting a couple of cat-naps if he was lucky. Then he had to put in a normal work day following his duty day. The Watchstanding Officers were very interested in my progress or more to the point—my lack of progress in qualifying as an Inport Duty Officer.

In September 1956, CAVALLA departed on an extended scientific cruise in the North Atlantic and Norwegian Sea to conclude with a visit to the British Submarine Base in Portsmouth, England. Our scheduled return to New London was mid-November, which made me happy because my first child was due the end of November. In late October we completed our surveys and headed for Portsmouth, England looking forward to a good time in London.

As the junior officer on board, I was GEORGE. I got all the jobs none of the other officers wanted. In addition to being Sonar officer, I was the Welfare and Recreation Officer, Supply Officer and Commissary Officer. Enroute Portsmouth we heard radio broadcasts of fighting in the Suez Canal area by the Israelis, French and British but I paid little attention because I was busy. I was arranging tour groups for liberty in London—I had scheduled busses to meet us on

the pier in Portsmouth prior to leaving New London—and preparing shopping lists for food and supplies. My orders from Commander Submarines Atlantic were to pinch pennies—this was the post Korean War era and money was tight. I was to limit purchases to fresh produce and the essentials necessary to get us back to New London.

On arrival in Portsmouth, I was happy to see the tour busses at the pier and I informed the hosting British officers that we would only need fresh vegetables, milk and fruit but no fuel. We were on the way home and would need no other consumables. There had been a U.S. Navy Captain on the pilot boat at the entrance to the harbor. On boarding, he went straight to the bridge, told the captain to let no one off the ship and he would talk to him in private once we were in port. About an hour after our arrival, the Executive Officer called the officers to the wardroom. He told us to load stores for 90 days, no liberty would be granted, we were to leave port the next day under sealed orders (no one, including the Captain, would know our destination or mission until we were at sea) and not to let the British know anything was out of the ordinary.

The Captain, bless his heart, got permission for our Guardmail officers to go to London to pick up the 2 months of mail we had waiting for us. The captain made half of the liberty parties Guardmail officers for a day trip to London and the other half for the night run. We used the tour busses to ferry the Guardmail parties to London and back. If they only had half as much fun as they recounted over the following weeks, they had a fantastic liberty. Even more amazing is that every last man was on board when we got underway the next day.

I went back to the British officers I had just told we needed little to nothing and put in a new requisitions for 60,000+ gallons of diesel oil, a ton of potatoes, a hundred cases of canned food all to be delivered at once, and no, nothing was out of the ordinary. We were just topping off for the run home and we would be departing the next day. The Brits hosted a great party for us that evening, delivered all the supplies with a smile and asked no questions.

Once at sea, the sealed orders directed us to proceed North into the Norwegian Sea. We were to establish a barrier to intercept possible Russian submarines heading South to assist the Egyptians. The North Atlantic in the winter is no picnic. We rarely saw the sun. We suffered waves 50-60 feet high. We were rolling 15° at 200 feet. Damp interiors shorted out heaters. It was cold, wet, dark and miserable. Gratefully

the 29 November fox sked informed me that I had a daughter, and mother and daughter were doing fine. Finally, near Christmas we were ordered home. There was no question in anyone's mind that the OOD conning CAVALLA into New London and making the landing would be Ltjg Hinkle. Winter storms slowed us and I had ample time to worry about the landing. And worry I did.

Those of you born and reared near water will wonder why simply conning a ship into port and alongside a pier should be a stressful event. You handled small boats and learned about currents, tides, and responses of a boat to screw and rudder before you learned to drive a car. You have no idea how foreign this is to a dry land farmer from the semi-desert area of West Texas where there are no rivers, no lakes and most of us never learned to swim. Even those of you who are experienced sailors will have to admit that conning a submarine up the Thames River, turning broadside to the current and maneuvering a 310' sub into a narrow slip that is only slightly larger than the sub is a challenge. I saw Henry Morgan, of the J.P. Morgan bank family, crash into a pier to the tune of several thousands of dollars in damages and he owned several boats and a good sized yacht. The squadron staff made such a fuss about it he offered to pay for the repairs himself.

Just so you know I had something to worry about let me explain the challenge. The bow of a WWII fleet boat converted to a streamlined GUPPY II is axe-like, compared to the bow of an unmodified fleet boat. I watched a GUPPY slice into a wooden pier all the way up to her bow planes, almost cutting the pier in half. The sub entered the slip at high speed because she was mooring to the down river side of the pier and had to get in fast to prevent the stern from being swept down and colliding with the submarine moored across the slip. Once well into the slip she started backing full to kill her way, but too late. The stern was still swept down enough so the bow had about a 20° angle when it axed about 30 feet into the pier.

There was not a lot of room in the slips, particularly when one or two submarines are already moored. Sometimes in one slip there would be 3 submarines moored. The last one in was a real shiphandler. In addition, the length of the pier was not much longer than the submarine itself. The piers were perpendicular to the river and the current would act on the stern of the submarine throughout the landing maneuver. The problem was exacerbated by the undersized rudder in the World War II subs. It was necessary to start the turn well out into

the river and calculate the drift so the sub would clear the pier and moored submarines as they entered the slip. I once saw a sub slam into the end of the pier, bending her nose as she came drifting down and misjudged her entry.

I once saw a fleet snorkel boat with an unmodified bow hit the end of the slip and knock over the phone booth with someone inside. The sub caught a log of cat-calls over the next few weeks because there was a perfect half-moon in the bow where it hit the stringer at the end of the slip.

Burned into my memory was the first landing after I reported aboard, when the bulbous bow touched the pier first. The ship was barely moving but 2100 tons doesn't need much velocity to create a devastating force. Stringers alongside the pier face dimpled the sheeting and broke 4 expensive hydrophones. The Captain and the OOD had to answer to a Naval Board of Inquiry.

The stern is a touchy area too. Lines must be put over as soon as possible to check the swing of the ship. The current is acting on the stern until the sub is all the way into the slip. There is a real danger of hitting the screws of the sub tied up across the slip.

At my request for a tutorial, the Captain explained—MAKING A LANDING IS SIMPLE. Knowing the current, ship's turning radius, distance from the piers, and ship's speed one turns to enter the slip as the bow clears the upriver pier, backs to kill way, and puts over lines as soon as possible to control any swing of the ship. Use the capstans to bring the ship gently alongside—touching neither bow nor stern first. I agreed with the principles—I wasn't so sure about the *simple* part.

The closer we got to New London the more I thought about the Landing. I was apprehensive to say the least. The Captain gave me several tutorials and patiently went over in great detail all the ins and outs of making a landing in New London. But I kept thinking about all the fiascos I had seen as boats rammed piers, snapped lines, collided with moored subs and in general botched landings. The skipper grew less patient as I pestered him about the landing. I was really trying to devise a cookie cutter approach and kept trying to get exactly what rudder and speeds I should order and when. Finally, he got angry and said "Damn it Dave, it's simple. You go up the river—when you think it is time to put your rudder over, put it over—it will be wrong. From there on in, you just correct your mistakes" and refused to discuss the

matter again.

Eventually, we approached New London, stationed the maneuvering watch and I took my place on the bridge as the OOD and started conning the ship into the Thames River.

I really started to sweat when we picked up the Commodore at New London Ledge Light and he said that COMSUBLANT would be on the pier to welcome us home. The Commodore was a little surprised when he discovered I was to make the landing. He suggested "George, why don't you take it on in since the Admiral will be on the pier." The Captain said "No, Dave can do it." When the Commodore discovered this would be my first landing EVER he again suggested "George, I think you ought to take it on in." The Captain was adamant that Dave could do it.

Let me tell you I wasn't so sure Dave could do it and I didn't feel any better when we got close to the pier. It was Christmas week and schools were out. There must have been 200 wives, children, and parents on the pier—not to mention the Admiral, his staff, the squadron staff, the band, plus the usual waterfront gawkers. The Commodore again pushed the Captain to take the conn and make a smart landing but the skipper just said, "No, Dave can do it" and I did. It wasn't a picture book landing but I didn't damage anything or scare anyone unduly so it was a success.

From that day on, whenever I have faced a challenge I remember Captain George Hayes words, "When you think it is time to put your rudder over—do it, it will be wrong—just correct your mistakes." I have never again been afraid to take a chance. The rewards have been beyond measure.

When Muriel and I decided to start Sonalysts, we divided the work. She would be the President and take care of administrative affairs. I would take care of marketing and technical. She worried that she would make a mistake. I told her she didn't have to worry about making mistakes—she would certainly make mistakes—so would I. When we recognized them we would correct them. And we did. Because we put our rudder over and just keep correcting our mistakes, Sonalysts is now a corporation of almost 500 professionals with sales well in excess of 50 million dollars.

It is a philosophy that I commend to you. Don't worry about a challenge. Just put your rudder over and start correcting your mistakes.■

LESSONS TO BE "RELEARNED" AFTER SAN FRANCISCO

by Captain W.G. Clautice USN(Ret)

Editor's Note: On January 8, 2005 USS SAN FRANCISCO (SSN 711) grounded at a position 360 nautical miles South-east of Guam, during a submerged transit from Guam to Australia. The ship sustained extensive damage and injuries to over 85% of the crew. One crew member later died of his injuries. The official Navy investigation revealed significant errors in navigational procedures and voyage planning that contributed directly to the tragedy.

Just a thought – since history seems to repeat itself, do we need a long range tickler system to review lessons learned 40 years earlier ... to ensure the training course lesson plan was not deleted? As I soak up the sun on a modern cruise ship in the Caribbean (currently the extent of my blue water travels), what brings me to this thought? Another e-mail re: the tragedy of USS SAN FRANCISCO (SSN711).

How could this have happened with the superb personnel who man the ships today? I meet them at Submarine League functions and am in awe. So how could this have happened ... *again*? Back in the early 60's, one of our boomers hit a seamount so hard that the pressure hull was cracked and the torpedo room had to be pressurized to get the ship back safely. Sound familiar?

In 1968 as an off-crew SSBN Navigator, I had the opportunity to fill an opening in Prospective Commanding Officer (PCO) School and read about 40 classified reports of recent collisions, bottomings and groundings. The freedom to operate at high speed for long periods without a fix was a new capability to diesel boaters accustomed to frequent fixes. I kept reading common threads in each investigation. One of those threads was chart inaccuracy.

Suddenly, I received orders to be a Submarine School instructor. With a smile, the Director of the Executive Division (then CDR Dick Peterson) handed me six pages of yellow legal size paper with a few bullets on each page in very large cryptic hand written notes. "This is the new two week Submerged Conning and Navigation Course which starts in about three weeks and you're it." Dick was being relieved by a CDR Bruce DeMars and this was my opportunity to excel?!!

Why the new course? In addition to the navigation problems above, the rapid expansion of the Submarine Force in the early 60's (commissioning a new nuclear submarine every month) introduced drastic manning measures, e.g., drafting non-submariners from Post Graduate School or surface billets to take an accelerated 3-4 year program to nuclear submarine command. At about the same time, the requirement to be a qualified OOD on a surface ship before entering sub school was dropped. Besides learning a new submarine, we now had to train the *baby ducks* (direct inputs from Officer Candidate School who had never been to sea)! And deck seamanship/navigation ranked way behind their nuclear propulsion plant qualifications.

Before becoming commissioning Navigator of the last of the "41 for Freedom" SSBNs, I had learned navigation and seamanship at the Naval Academy, qualified as an OOD on a DD, done the "Days Work in Navigation" while qualifying in submarines on a diesel boat, had 3 full tours at sea (DD, SS, SSBN) and completed all of the Navy navigation correspondence courses before going through Dam Neck to learn inertial nav. Despite all this, I was shocked at how much I learned about piloting during our 2-month shakedown and was still learning from those investigation reports in PCO School.

On a personal note, I threw myself with a vengeance into building the curricula and lesson plans for this new course. First lesson was an introduction into all the tools (charts, pubs, etc., including the 3-arm protractor in case you lost the gyro while piloting). Speaking of piloting, I developed a recorded exercise as if you were plotting your progress up the Cooper River into Charleston. As the tape played and bearings were called out, the students found some difficulty with their skills of laying down the 3 minute fixes, making recommendations and answering the questions from the skipper on the bridge. (I didn't tell them until the final exam that the 3-minute fixes actually came at them every 2 minutes.)

Every lesson learned was in that course. But now one in particular stands out... the SSBN collision with a seamount due to chart inaccuracies. In preparing that lesson plan, every on board chart of that area was consulted. The LAT/LON of that seamount differed by over 5 miles depending on which chart you used. I plotted the worst-case charts on one viewgraph to show this graphically to the students. It was amazing to see the lights go on when they saw and understood this. They were then taught to be a healthy skeptic even when things

looked reasonable...prove that you are *not* somewhere else...what *could* go wrong?

To drive it home, I lectured about a personal experience returning from a North Atlantic patrol on a track given us by CSL and J5 (our operational command). Their track took us directly between two seamounts three miles apart with peaks above 180 feet (while we were transiting full speed at 200 feet). Despite being confident of our dead reckoning position, I just didn't feel comfortable going between 2 mountains. But, should we slow, come up and get a fix? If yes, at what point? Or should we go around the seamounts and how far? After a great deal of thought, I put all of the worst-case factors together and made my recommendation to the CO.

Ultimately I wrote a paper based on this ..."Fix Expansion and the Third Dimension". It was published in the Submarine Quarterly Information Bulletin and included in the course. Many years later, I was surprised when I met a former SUBPAC PCO Instructor (Dave Duffie'), who said he was *honored* to meet the author of that paper. He still calls me Magellan. But more astounding was a note a few years ago from a friend and former Trident CO (Bob Speer) mentioning that SUBPAC COs were complaining that my paper was too restrictive. I would hope so. It was written as *a thought provoker* 30 years earlier. Somehow it had become a SUBPAC edict!

Well, the fallout of all this is that I became curious. What is being taught today? Does the Submerged Conning and Navigation course still exist? Have any of those lesson plans survived? Hopefully the answers are all *yes* or things are much better. If not, should we set it up again with a long-range tickler system for 35 years from now to go back and see what was taught back then and possibly lost due to the passage of time? Could we prevent another seamount collision 35 years from now? Just a thought!

Well, last week, at the JHU/APL Submarine Technology Symposium, the Head of the Submarine Learning Center (Captain Arnie Lotring...an SSN Navigator and PCO Instructor) gave a superb presentation about where they are heading. I asked about what is being taught today. The answer he provided is as follows:

After nuclear training (1 year) officers receive 10 weeks of the Submarine Officer Basic Course (SOBC). During this course they receive familiarization training on (TMA) target motion analysis, periscopes, and navigation equipment.

During their first year aboard, officers are required to complete three one week courses, called Junior Officer courses (JO-1, 2, and 3), taught in each of our submarine homeports and focusing on ship handling, contact coordinating and navigation (surface and submerged). The courses are each preceded with pre-requisite training employing the Submarine Onboard Training Program which uses computer based training products (courseware and simulations) to allow onboard training before arriving at the school. Once in the school they use very sophisticated trainers including the virtual reality ship handling trainer called VESUB and the Submarine Piloting and Shiphandling Trainer (SPAN 2000). This training is supplemented in the classroom with group projects which include lessons learned and practical exercises.

During department head school, called the Submarine Officer Advanced Course (SOAC) which is 22 weeks long, each prospective department head participates and then is evaluated against fleet standards in shiphandling and navigation (surfaced and submerged). During the final two weeks of the course, they are divided into their specialty (engineers, weapons officers and navigation officers) for further focused training.

The XOs and COs, who now train together in a course called Senior Command Course (SCC), get dedicated classroom time in the newest digital navigation systems and practical experience on ship handling and navigation trainers. Again, a prospective XO will repeat the nine-week course as a PCO. Underway, each candidate will get hands on shiphandling and navigation practice.

Captain Lotring went on to say..."We are rapidly transitioning to electronic charts, where preparing and updating will transition to flat panel displays. Chart updates will be the skill of merging various bathometric data bases. Periscope rounds will be automatically projected onto the screen as the scope pickle is pressed ... no more manual rounds. Bill, I think we have a good program. Understanding there are only so many hours in the day, we continually evaluate, with the TYCOM Deputies for Training, whether we have the right mix of hours and topics. As you can imagine, everyone has an opinion. And as always, we are relying on a robust onboard training program where our Chiefs, XOs and COs are passing on their experience and knowledge to our new officers ... just as I'm sure you did many years

ago." Amen to the many years ago and thanks Captain Lotring for the update!

A few final thoughts ... despite all the modern trainers and updated training, we are still having these terrible accidents as we had in the early 60s ... caused by faulty navigation. I suspect the best path to nuclear submarine command is still through engineering assignments and our COs are much better trained in engineering than navigation. The top performing officers are most likely assigned as Engineer Officers. Perhaps this should be evaluated and if so, compensated for by even more emphasis on safe navigation training and practices.

In nuclear power training, we are taught to trust our instruments and make professional judgments based on what they tell us. But navigation, despite all our modern devices, is still an art, and the prudent and experienced navigator will always have a healthy skepticism towards his equipment and especially his charts.

The vast majority of our charts are based upon surveys taken long before it was possible to accurately fix the position of the survey vessel. And yet, far too many mariners believe that their charts are accurate. As such, the Navigator must learn to develop an approach to his task with a mindset that is almost the direct opposite to that of the nuclear plant operator.

So, it appears the tickler system is not the answer today, but what is needed is to truly evaluate the performance level of our Navigators and the manner in which they are selected, trained and indoctrinated. The fact that we continue to have serious navigational accidents, while essentially having no serious nuclear plant accidents, clearly suggests that our nuclear plant operators are being properly trained, but not our Navigators. Given the wake up call of the SAN FRANCISCO tragedy along with the conscientious and experienced folks running the Submarine Force today, I suspect these reviews and corrective actions are well underway...but perhaps we should tickle another review for 35 years from now or sooner.■

SUBMARINE COMMUNITY

EULOGY FOR SLADE CUTTER
06 JUNE 2005
DELIVERED BY
REAR ADMIRAL JAMES WINNEFELD, USN(Ret)

If it were possible somehow for Slade Cutter to return to Annapolis this morning. He would be met by the same blast of heat that is plaguing us. Slade might be forgiven if he were to observe:

"Whoa! I am in the wrong place. I must have taken a wrong turn. This is not what I was promised!"

A deep voice might answer, "Slade, my son, you **are** in the right place. No, you didn't take a wrong turn. You are among your family and friends."

Slade might cut in at this point and say, "I may deserve this, but they don't."

Slade Cutter was used to heat—even remarkable heat: The heat of battle, the heat of passion, the heat of strong argument. He experienced them all.

Slade Cutter was a **remarkable** man. A good son, a good brother, a good husband to two great ladies, and a good father. He was also one of the best naval officers I ever knew—particularly if your image of a naval officer is one of fighting his ship [not a desk]– and winning.

He was not complicated. He believed in the simple virtues of honesty, openness, an overwhelming sense of duty—for which he would give his experience at the Academy full marks—and above all a sense of service and honor.

What you heard and saw was the real Slade Cutter. He told it like he saw it—and that is the way he lived his life.

Occasionally it got him in trouble in the **peacetime** Navy but his fellow warriors knew he was a rock on which to build mutual trust.

When he made a promise, he kept it—whether to the service, his wife, or his family. When he raised his right hand and swore the oath as a new midshipman in 1931, it was a blood oath and one that he observed to his last breath.

Slade Cutter was a man of action—whether it was his famous left hook, or his right foot connecting with a football, or a torpedo sent on its way from SEA HORSE—he knew what had to be done and he did it. There was no hesitation; no half measures.

But perhaps what I most remember about the man was his approach to life. If he had been an average man he would have had a lot to complain about—career disappointments alongside his many accomplishments, declining health, spending most of the last years of his life in a sick bed. But I never heard him complain— not once.

The Naval Academy changed Slade Cutter's life. He arrived at Severn Prep School across the river a raw farm boy from Illinois and was considered by many to be a free spirit who enjoyed pressing the envelope. But when he graduated from the Academy five years later—now a strapping man, a star athlete, and used to leadership—he had settled down and taken on responsibilities. The change was widely remarked among his classmates.

Slade's great good fortune was to have been married to two great ladies, ladies who deeply loved him and were loved deeply in return. I should not surprise us that these ladies were close personal friends. In the past three years I have gotten to know Ruth Cutter and seen the care she has lovingly given to a proud but ill hero. Thank you Ruth for taking such good care of our friend and comrade.

Slade once told me that his crew in SEA HORSE led him and he led them. They led him by their expectations of him and he led them by trying his very best to fulfill those expectations. The Lord has led Slade by his expectations of him and Slade has become a follower at last by coming home to meet his last obligations with joy in his heart and the knowledge that he has done his duty to God and country.

A final word for those who mourn for Slade and his family. If Slade were standing up here, he would say: "I have fought a good battle for my family, shipmates, Navy, and country. I don't see today as an occasion for grief; I see it as a cause for celebration. **The fight is over and we won."**

Let me close on a personal note. Perhaps the most emotional moment of my life occurred two months ago in Alumni Hall at the

Distinguished USNA Graduate Ceremonies—watching with many of you—Slade Cutter receive the cheers of a standing Brigade of Midshipmen. Slade with a tear in his eye waved back to them and was obviously saying his final goodbye to an institution he deeply loved.

Goodbye proud, but gentle warrior, until we all meet again.■

TO DRUM KIDS AND GRAND KIDS
MOBILE, JUNE 2005
19 May 2005
Remarks by RADM Maurice H. Rindskopf, USN(Ret)

Editor's Note: DRUM (SS228) has been a tourist attraction at the ALABAMA Memorial Park in Mobile, Alabama since 1970. She has been out of the water on saddles since 2002. The World War II crew has held reunions there continuously since 1971. In June 2005, one officer and 12 crew were on hand along wiht 27 family members, including kids and grandkids. RADM Mike Rindskopf, a plankowner with 11 patrols including two in command, could not be present at the reunion but prepared these remarks–addressed to those kids and grandkids.

Rosamond Rice, a resident of Annapolis, MD and a daughter of DRUM's commissioning skipper, LCDR Robert H. Rice, delivered the remarks.

It has been almost exactly 60 years since that exciting first night off Nagoya, Japan when DRUM made its initial night surface attack, and in return, suffered some 22 hours of depth charging.

There are still a few of us left who made that first run and some of those have been regular reunion participants. We have regaled our shipmates (and lots of others) with tales which have grown in scariness to the point that some of them probably occurred only in the imagination of the teller. I know this is true since I have been party to them over the years myself.

But tonight I want to come at this story from a different direction. I want to talk particularly to the children and grandchildren of the twenty-odd officers and some 250 men who sailed in DRUM through three and a half years and 13 war patrols-and came home to full and satisfying careers with their families which grew perhaps from a mom and dad to a wife and bunches of kids.

So here's what I want the kids and grandkids to hear:

DRUM was commissioned in Portsmouth, NH just as the United States became involved in a major conflict, some 25 years after the conclusion of "the war to end all wars". But, for submarines it was a

war like no other the U.S. Submarine Force ever fought, and may never fight again. We were neophytes by any definition.

Before we sailed from cold New England in the winter of 1942 into an Atlantic ocean literally full of Nazi U-boats, we readied our 24 torpedoes as war shots-a sobering three days work which not one of our talented torpedo gang or their young torpedo officer had ever accomplished. We knew how to drive our ship, but there was a lot about attacking a determined enemy we did not know-and truly, could not know except by experiencing life in the trenches, as it were.

During our Pearl Harbor training, we actually heard a couple of friendly depth charges but not a man aboard said "Hey, let me off, this isn't for me"! On our two week trip to Japan our lookouts learned to see sea gulls at two miles, and the infrequent Japanese plane far enough out to let us dive and evade. Our engineers and electricians learned that they could live without sunshine and fresh air for almost 60 days, and be none the worse for wear. The ship's cooks knew that Napoleon said "an army travels on its stomach" and thus reveled in the thought that they were the most important gang on board even if they also were the target of daily pointed suggestions. Yes, it's true. "If it's smoking, it's cooking, and when it's burned it's done". We tried limiting smoking to 10 minutes per hour, but soon learned that people in their bunks were requesting calls hourly so they could have their drag. But on our second patrol, we lifted restrictions and cut down smoking markedly, leaving the air only "somewhat polluted" after 12 hours submerged. I never smoked so I can't guess what affect this had on lifetime smokers.

What dad or grandpa has told you about the two weeks we spent off the ship between patrols may range from bragging to downright untruths. Let me say that two weeks on Waikiki beach or in Brisbane and Sydney, Australia with girls and bars all around is a far cry from the same 14 days on Midway Island or Majuro Atoll in the middle of nowhere. I'll wager, too, that you heard that the crew regularly whipped the officers and chiefs at softball, but that is only because they would not play unless it was by their rules.

We arrived in Brisbane, Australia in May 1943 for the first of three refits in that interesting land. It was then that I suddenly realized that submarine losses were mounting, especially in the Southwest Pacific; and that we, in DRUM, would have to make the most of our training to ensure that every challenge we confronted was met by performance

of the highest order from the skipper down to the junior seaman and fireman.

After our third patrol, Lieutenant Manning Kimmel, the Admiral's son, and our most capable engineer was transferred to new construction in Manitowoc, Wisconsin as the executive officer of Raton; and from there to Command of ROBALO. She was lost to an enemy mine off Indonesia in July 1944. Later Lieutenant John Harper who made six runs with us was also transferred to new construction as executive officer of SHARK II. She was lost to depth charging in an area next to DRUM in the Taiwan Strait in October 1944. It was on my last patrol that we heard a sustained depth charging-not all that far from us. The Submarine Force suffered the highest casualty rate of all branches of the service-some 20% of the boats that went to sea!

We all left families at home who fought the 'Home-Front" war, many by working, and others by raising some of you. Whether they lived in a Navy town, a large city, or a farm way out yonder, everyone supported the war; everyone was gung-ho in cheering us on for what we were doing so far away. They knew that it was a dangerous business we pursued, but they had faith that the team which manned DRUM (and all the other boats in the war) had what it took to get home, not once or twice but 13 times. When it was all over, and DRUM came home for decommissioning, every officer and man came home a hero!

Contrast that attitude with that which our nation developed during Vietnam where opposition to the very involvement in the war, even with the loss of more than 50,000 men, made coming home a nightmare for almost every veteran. Most, or all of the DRUM family watched from the sidelines, but we were not happy to see how it turned out.

Now, we in the DRUM family may be going through another cycle with family engaged in Iraq, Afghanistan, Kosovo, or Uzbekistan. We hope that the values we learned in that long ago massive conflict will somehow reach down to each of you as you follow your chosen path, or perhaps one which Uncle Sam has chosen for you.■

USS ALBACORE (AGSS 569) AND THE SUBMARINE HALL OF FAME

by LCDR Jack Hunter, USN(Ret)

It was a warm, sunny morning in Norfolk, VA on Friday, May 27th, 2005 when members of the Tidewater chapter of the Submarine Veterans of World War II and the Hampton Roads Base of the USSVI assembled to conduct a service of remembrance. At the conclusion of the ceremony remembering the boats and men lost during WW II and the Cold War, the submarine ALBACORE was inducted into the Submarine Hall of Fame. A former ALBACORE crew member was invited to participate in the ceremony and I was fortunate enough to draw the long straw.

Eight years ago, the Tidewater chapter of the Submarine Veterans of WW II began considering boats to be inducted into the Submarine Hall of Fame. Boats are selected through a nominating and voting process conducted by the Hampton Roads Base of the USSVI. Nominations are accepted during November of each year and a boat is chosen by vote of the membership the following February. General criteria for nomination include boats associated with certain feats or occurrences, boats having particular engineering features, and boats recognized for operational achievements or subject to international acclaim. For each boat selected, a shadow box filled with memorabilia from that boat is placed in Alcorn Auditorium in Ramage Hall, home of Submarine Learning Center, Norfolk.

Boats inducted into the Hall to date are:

USS HOLLAND (SS-1), the first official submarine

USS IREX (SS 482), the first U.S. submarine to have a snorkel system

USS NAUTILUS (SSN 571), the first nuclear powered submarine

USS NARWHAL (SSN 671), for 25 years of Special Operations

USS NORFOLK (SSN 714), the first submarine to have all its Tomahawk missiles hit their targets

USS TRITON (SSN 586), the first U.S. submarine to circum-

navigate the world submerged and first twin reactor submarine
USS GRENADIER (SS 525), for forcing a Russian diesel submarine to the surface during North Atlantic Cold War operations
USS ALBACORE (AGSS 569) for her hull and other advanced submarine engineering and design Innovations

Launched in August of 1953, ALBACORE was commissioned in December of that year. In September of 1972, she was decommissioned and moved to the Philadelphia Naval Shipyard. She remained there until 1984 when she was towed to Portsmouth and later moved to her current location in 1985.

ALBACORE was a one-of-a-kind submarine built and maintained in Portsmouth by the skilled craftsmen of the Portsmouth Naval Shipyard. Administratively a part of Submarine Squadron Two in New London, CT. ALBACORE was home ported in Portsmouth for her entire life.

Under the leadership of Admiral Charles Momsen, ALBACORE was conceived to inaugurate a radical change in submarine design. World War II experience had shown that speed, endurance and maneuverability were key requirements for submarines. As a result, ALBACORE'S hull was designed with underwater speed as the prime requirement. Scale models of the hull were tested in tow tanks and wind tunnels to determine the optimum shape. Albacore was the first modern submarine to have the rounded hull and a single propeller. She was later outfitted with a second counter-rotating propeller as part of an experiment to provide greater propulsion efficiency.

For almost 19 years, ALBACORE served the Navy as an experimental vessel. Among things tried that were not too successful were: using a parachute to decelerate the boat, dive brakes, and slippery water. As for successes, she demonstrated the use of several types of towed sonar devices, tested four different propulsion and control surface arrangements, evaluated several combined instrumentation panel displays, used sound quieting techniques for rotating machinery, introduced aviation type controls, and evaluated a more effective ballast tank blow system. As a result of ALBACORE's service, the Navy was able to refine designs and concepts before incorporating them into the fleet. ALBACORE truly lived up to her motto: *Praenntius Futuri* or *Forerunner of the Future.*

The Friends of ALBACORE wish to thank the Tidewater Chapter of U.S. Submarine Veterans of WW II and the Hampton Roads Base of the USSVI for their recognition of ALBACORE and its contributions to our submarine Navy. ALBACORE previously had been designated a National Historic Landmark for her contributions to submarine design, a Historic Mechanical Engineering Landmark for her many unique systems and a Historic Welded Structure for her hull.

In a related note, in the October 2004 issue of THE SUBMARINE REVIEW, LCDR Jordan wrote of the efforts of our Friends of ALBACORE group to respond to a challenge grant made by Steve Cuff, a former ALBACORE ShipSup. The fund raising campaign was successful in raising over $28,000 from former shipmates. A portion of this money has been invested in a recently activated audio tour system consisting of five sites external to the boat and eleven internal sites. Each site provides about two minutes worth of information, remembrances and sea stories for our visitors.■

THE SUBMARINE TRADITION
USSV WWII National Convention
Phoenix September, 2000

by Mr. Billy Grieves

Billy Grieves enlisted in the Navy April 13, 1939 at the age of 18. After Submarine school and duty in USS-R-10 he was assigned to USS THRESHER (SS-200) which went to Pearl Harbor in April of 1941.

This year marks the 46th birthday of the United States Submarine Veterans of W.W.II. And, just as in all those other years, we submariners gather together to celebrate the true purpose of our organization with our memorial service. It is fitting that this continuity be preserved because if there is one word which is synonymous with the very foundation of our organization that word is *remember*. And that is the theme of our service today.

Clare Booth Luce is a very distinguished American. And on the eve of her retirement from public service she opened her farewell address with these words, "With age comes the appreciation of old things; old wine, old books, old pictures. . .but most of all, old friends." For old submariners, those words ring with a haunting persistence. Our lives have spanned what is unequivocally the most eventful, the most productive, the most terrible yet the most glorious period in American history. And now in our twilight years as we enjoy all the comforts of this modern, pampered life brought about by such amenities as jet-travel, television and microwave ovens, many of us can still remember the old times, the ones we look back upon with nostalgia; when an automobile was a rare sight on the streets of our town, and if one did appear it frightened the horses; when the summer ice box had a drip pan underneath, and the winter ice box was an orange crate attached to the outside of the kitchen window sill; when milk was delivered to the door step by a horse-drawn wagon and in the wintertime the cream expanded up out of the neck of the bottle, like a popsicle, when it froze; when the weekly laundry was done on a scrub board in an open tub; and when the carpet needed cleaning, it was hung on a clothes line and beat with a wire carpet beater. And when it was time to get out of bed in the wintertime, the entire house was awakened when father

shook the stove. But on these occasions, when we are looking back, it is the old friends who dominate our recollections.

Today we are living in a time when nostalgia is in vogue. It has become fashionable to remember. Vintage cars, antique furniture, silent movies. . .even patriotism is enjoying a comeback. Old fashioned is modern again. But nostalgia should preserve more than old wine, old books and old pictures. Nostalgia should also preserve the old traditions! Patrick Henry once said,

> *"The voice of tradition, I trust, will inform posterity of our struggles for freedom.*
> *If our descendants be worthy of the name Americans, they will preserve and hand down to their latest posterity the transactions of the present times."*

But today tradition is a word that fits uncomfortably into our modern, computer age language. The fascination now is in *new* ideas and *bold* changes.

And many of our American traditions have become lost and forgotten in the archives of time. Such as the display of our country's flag in our school class rooms along with the saying of prayers and the Pledge of Allegiance. And playing our National Anthem in our public theaters at the start of the evenings program. Many of the values which you and I grew up with are no longer in evidence. When you and I were kids going to school back in the *twenties* and the eleventh hour of the eleventh day of the eleventh month rolled around, at the teacher's command that we put our heads on our desks and we kept still. For a full minute we kept still. Everybody kept still. People stopped in the streets and men took their hats off. People in stores paused and stood there silently. And the church bells began their symphony. All over the city they rang out. They called it *ARMISTICE DAY* then and it was in memory of those men who gave their lives in World War I. Such practices have long been abandoned. World War I was supposed to be a war to end all wars. . .it wasn't. It was supposed to make the world safe for democracy. . .it didn't. And subsequent wars have long since over-shadowed the impact and magnitude of World War I. But to the veterans of that war, remembering those men

on their special day was an important tradition.

When we were young we looked upon *tradition* as something old, something that happened centuries before our time. But tradition has no time frame.

At the gates to the modern Trident Training Facility at the submarine base in Bangor, WA, there is a sign bearing these words, "Pride in the past runs deep in the present." Pride in the past? How far in the past? Our modern nuclear submarine sailor has a motto: "Submarines may change. . .but not the men." He is proud of his heritage from the past. And proud to consider himself a part of it now.

But American submarine tradition did not get its start from John Holland; it didn't start with David Bushnell and the *Turtle*; it doesn't go back to Simon Lake. American submarine tradition was born with the Fleet Boat and the S-Boat and World War II.

Time ran out for our Fleet Boats and our S-Boats. They were part of a glorious victorious era that is no more. And they hold an exalted place in our history.

You and I, speaking collectively, have erected memorials all across this country: Monoliths of stone and bronze; cadavers of aging submarine hulls and torpedoes. We erected these memorials to serve as reminders to future Americans of an heroic moment in our country's history. But old submarine hulls and torpedoes are biodegradable. This means that in time they will all be reduced to the dust from which they were created. . .and so will you and I. And some day you will attend your last convention; you'll sit at your last banquet; and then will come your last day, your last hour, your last breath. And when you are gone what will be your legacy? What will you leave behind as evidence that your were ever here? Your estate? All that you have worked for and accumulated throughout your life time? It is an immutable fact of life that within an incredibly short time your estate will be assimilated into those of your survivors and will no longer be recognizable as ever having been a part of you. Your memory? Oh, it will hurt to lose a husband, a father, a friend. But inevitably the pain will subside, and like your memory it too will fade. But there is something more that you leave behind. Something more significant than your estate, something more durable than your memory, something which sets you apart. You leave behind a *TRADITION*. A tradition of *honor*. A tradition of *loyalty*. A tradition of *courage*. A tradition which should live and endure because it has been paid for

with great suffering. . .and tremendous sacrifice. Fifty-two of our boats, one out of every five that put to sea on war patrol, did not come back. And there is a large group of men who cannot be present today to hear these words of tribute and honor; valiant men who lie within those hulls wherever they rest. These are the men we *remember* today.

For those of us who went to sea aboard submarines, death was a very real and close companion. And there are times today when we still wonder at the vagaries of fate which spared us but claimed so many of our brothers. And it leaves us who remain to carry on with a sacred obligation: The responsibility to make heard the voices of more than 3,600 of our shipmates who paid such a severe price for the freedoms we enjoy. Voices, which if they could speak out, would plead, "Do not forget us. Your memories are our greatest monument." Their sacrifice is the legacy of our generation to every American who cherishes liberty and freedom and our American way of life. It is the inspiration which has preserved our honored submarine tradition in our submarine men to this day.

Now may the souls of our valiant shipmates rest in peace in the blue depths of the oceans of the world which they made safe. . .and free. . .for all men.■

LETTER

COUNTERING COUNTERPOINT

by Mr. Norman Polmar and Mr. Kenneth J. Moore

Although the editor's review and subsequent commentary on our book Cold War Submarines probably represents the longest *book review* in the history of THE SUBMARINE REVIEW, he has still not described the unique features of the book. For example, it provides the first comprehensive description of Soviet submarine design efforts during the Cold War, both submarines built and not built. The book was written in collaboration with the two major Soviet submarine design bureaus, with several other Russian submarine-related institutions contributing. And, the book's 100-plus photos include many not previously published in the West, and also 80 line drawings, most produced specifically for Cold War Submarines.

But the editor chose to concentrate his comments on our alleged efforts to question the accomplishments (and failures) of Admiral Rickover. To *prove* his point, in the April 2005 issue of THE SUBMARINE REVIEW, the editor cites the last line of the book.

That single line is somewhat misleading when taken out of context. The final line answers a key question that must be asked when considering U.S. and Soviet submarine developments during the Cold War. The two previous paragraphs of the book read:

> Since it appears unlikely that there will be a conflict between the United States and Russia in the foreseeable future, especially in view of the decrease in Russian submarine production rates and operating tempos, it is unlikely that U.S. and Russian submarines will ever be measured in combat. Thus, the answer to the question of which approaches to submarine research and development, design, construction, manning, training, support, and operations are superior may never be answered, or at least until some time in the future when currently classified information is revealed.
>
> Still, considering the industrial, manpower, and operational limitations of the Soviet state, the Soviet achievements in submarine design and construction appear even more impressive. In discussing those achievements at the Malachite subma-

rine design bureau in St. Petersburg, one of the Russian engineers leaned across the conference table and asked one of the authors of this book:

"Do you know how this situation came about?"

In response to our puzzlement he declared: "We had competition in submarine design. You [in Rickover] had Stalinism!"

Again, the reader of THE SUBMARINE REVIEW is urged to read Cold War Submarines and to make his or her own conclusion.■

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 Perfect. If possible to do so, accompaning a submission with a 3.5" diskette is of significant assistance in that process. Editing of articles for clarity may be necessary, since important ideas should be readily understood by the readers of the **REVIEW**.

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

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

Articles should be submitted to the Editor, SUBMARINE REVIEW, P.O. Box 1146, Annandale, VA 22003.

BOOK REVIEW

PRIDE RUNS DEEP

By R. Cameron Cooke
Penguin Group (USA) Inc, March 2005
345 pp - $7.99, ISBN 0-515-13833-9

Reviewed by Mr. David Lipscomb

Editors Note: This book review is of a fiction piece, and while we usually do not run reviews of fiction, it was felt that since the author is a former submariner this could be of interest to our readers.

Having just completed four very successful war patrols and been awarded the Navy Cross, Lieutenant Commander Jack Tremain is unexpectedly assigned to command the Pearl Harbor based submarine, USS MACKEREL, a boat the sailors say is cursed with bad luck. Tremain's almost insurmountable challenge is to raise MACKEREL from the depths of poor performance and morale to be a warship of peak aggressiveness and strong pride. As the novel's central character, Tremain convincingly demonstrates how stern discipline combined with true compassion for his men are essential elements for the world's loneliest job, command at sea.

Set one year after the Japanese attack on Pearl Harbor, with the US holding action in the Pacific still critically dependent on submarines, *Pride Runs Deep* captures the unrelenting tension and psychological impact of submarine patrol warfare. In his first novel, R. Cameron Cooke, himself a submariner, has adroitly weaved a story with gut-wrenching action and characters all too fallible to the strains of wartime demands.

Other characters add credibility to Cooke's crisply written drama. After MACKEREL passes its first wartime test and returns to Pearl, she is assigned a foreboding mission in Japan's home waters. There, the officers and men of the MACKEREL are stretched to the limits of physical and mental endurance. Newly arrived OCS graduate, Ensign Ryan Wright becomes an unsuspecting hero when subjected to wartime pressures while his antithesis and constant tormentor,

Lieutenant Tucker Turner, struggles with events that test his personal integrity. Those who have served in the military will appreciate the way Cooke develops the bonds (both good and bad) between officer and enlisted, and how these bonds have a direct impact on accomplishment of the mission.

Cooke's primary theme of pride instilled by a competent leader into a disciplined crew is an echo of a similar premise written over thirty years ago—Lother Gunther Buchheim's stellar novel about German sea patrols in the Atlantic, *Das Boot (The Boat)*. Like Buchheim, Cooke masterfully transports you into the cramped and hazardous world of submariners and the stress of battle.

Though Cooke served on nuclear submarines, his research on diesel-powered subs from both the technical and historical perspective is detailed and meticulous. Diesel boaters will appreciate the comment made by Captain Steven Ireland, Submarine Squadron Seven and Tremain's Commander, who told his hand-picked skipper, "You smell like you have been at sea for seven weeks, Jack."

Cooke's very believable characters captivate the reader, causing insomnia for most. Though the novel is fictional, we can well imagine events like those described actually happened during submarine patrols, both Pacific and Atlantic. *Pride Runs Deep* is a fast paced, entertaining read, and will surely be enjoyed by submariners and anyone who appreciates a good war novel.■

Naval Submarine League 2005 Award Winners

Jack N. Darby Award
Commander Robert P. Burke

Frederick B. Warder Award
LCDR Jimmie L. Miller

Levering Smith Award
LCDR Clifton B. Mygatt

Master Chief Frank A. Lister Award
CMDCM (SS) Rick Laurence Atkins

Charles A. Lockwood Award
Officer- LCDR Jeffrey Lamphear
Chief Petty Officer- Chief Machinist's Mate (SS) Kemuel A. Clark
Petty Officer- Machinist's Mate First Class (SS)
Dustin Scott Dooley

Distinguished Civilian Award
Dr. David L. Stanford

Gold Dolphin Award
CAPT Pat Scanlon, USN, CO USS ASHVILLE (SSN758)

Silver Dolphin Award
CMDCM (SS) Russell Clark Neal, USN USS PROVIDENCE (SSN719)

Naval Submarine League Literary Awards

First Place- RADM W. J. Holland, Jr., USN (Ret.) for "Offensive ASW- The Right Answer for the Right Time"

Second Place- CAPT James H. Patton, USN (Ret.) for "Comms at Speed and Depth: How/For Whom/When"

Third Place- CAPT William L. Norris, USN (Ret.) for "Rethinking Our Nuclear Future"

2005 Award for Best Article by an Active Duty Author
Commander Michel Poirier, USN for "An SSN in the GWOT"

Naval War College Literary Award
CAPT Monte Khanna, Indian Navy

Seventh Annual UNDERSEA WARFARE Magazine Photo Contest Awards

First Place- David Levy
Second Place- Michelle Crum
Third Place- Kurt Lengfield
Honorable Mention- Danielle Sosa

NAVAL SUBMARINE LEAGUE HONOR ROLL

BENEFACTORS FOR MORE THAN TWENTY YEARS
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AMERICAN SYSTEMS CORPORATION
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EG&G TECHNICAL SERVICES, INC.
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NORTHROP GRUMMAN CORPORATION - NEWPORT NEWS
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- OCEANIC & NAVAL SYSTEMS
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CORTANA CORPORATION
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DYNAMICS RESEARCH CORPORATION
GENERAL DYNAMICS -AIS
HYDROACOUSTICS, INC.
KOLLMORGEN CORPORATION - ELECTRO-OPTICAL DIVISION
L-3 COMMUNICATIONS, OCEAN SYSTEMS
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NORTHROP GRUMMAN CORPORATION -SPERRY MARINE DIVISION
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SARGENT CONTROLS AND AEROSPACE
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SYSTEMS PLANNING & ANALYSIS, INC.
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AMERICAN SUPERCONDUCTOR CORPORATION
ANTEON CORPORATION - SEA SYSTEMS DEPARTMENT

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GOODRICH CORPORATION - EPP DIVISION
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MATERIALS SYSTEMS, INC.
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PEROT SYSTEMS GOVERNMENT SERVICES
SCOT FORGE COMPANY

ADDITIONAL BENEFACTORS
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DRESSER-RAND COMPANY
DRS TECHNOLOGIES, INC.
DURATEK, INC. (New in 2004)
FOSTER-MILLER, INC. (New in 2004)
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L-3 COMMUNICATIONS CORPORATION
MARINE SONIC TECHNOLOGY, LTD.
MICROPORE, INC.
NAUTRONIX MARIPRO INC.
NEKTON RESEARCH, LLC (New in 2005)
NUCLEAR FUEL SERVICES, INC. (New in 2005)
OCEANWORKS INTERNATIONAL, INC.
OIL STATES INDUSTRIES/AEROSPACE PRODUCTS DIVISION
PACIFIC FLEET SUBMARINE MEMORIAL ASSOCIATION, INC.
PINKERTON GOVERNMENT SERVICES
PRIME TECHNOLOGY, LLC (New in 2004)
PROGENY SYSTEMS CORPORATION
RADIAN MILPARTS
SSS CLUTCH COMPANY, INC.
SUPERBOLT, INC.
WHITNEY, BRADLEY & BROWN, INC. (New in 2004)

STRATEGIC SYSTEMS PROGRAMS GOLDEN ANNIVERSARY

Established as the Special Projects Office (SP) under the leadership of RADM William (Red) Raborn in November 1955, the office now known as Strategic Systems Program (SSP) will celebrate its 50th anniversary this fall. As the oldest program office in the department of Defense (and the most successful), SSP has developed six generations of fleet ballistic missiles and two classes of fleet ballistic missile submarines with *cradle to grave* responsibility for the strategic weapons systems. SSP has managed the POLARIS Sales Agreement with the United Kingdom allowing the Royal Navy to purchase first the POLARIS (A3) missile and later the TRIDENT II for their ballistic missile submarines. SSP is an outstanding example of technology, management and purpose with a dedicated team of government and contractor personnel.

To commemorate this historic occasion, the SSP Historical, Educational and recognition organization (SSP HERO) will sponsor a 50th Anniversary Dinner on Thursday evening, September 29, 2005 at the Hilton McLean Tysons Corner hotel, Jones Branch Drive, McLean VA. Ticket price is $75.00. Reservations can be made by mailing checks to:

SSP 50th Dinner
P.O. Box 2463
Fairfax, VA 22031-0463

Make checks out to: SSP HERO

Everyone and their guests who are or were part of the SSP family, military, civil service and contractors are welcome. Seating is limited to 900 people so first come first serve. Additional details can be found on our website at: www.ssphero.org.

REUNIONS

USS ANDREW JACKSON SSBN-619
September 2, 2005
Union Hill Veterans Hall, 3027 Walnut, Kansas City, MO 64108
POC: Nolan "Moose" Beatty E-mail: nbeatty@kc.rr.com

USS BUMPER (SS-333) ASSOCIATION
September 5, 6, 7 & 8, 2005
Ramada Plaza Hotel & Inn Gateway, Kissimmee, Florida 34747
POC: Edward W. Stone, Secretary
308 Merritt Avenue, Syracuse, New York 13207-2713
Tel: (315) 469-3825

USS HENRY L. STIMSON SSBN-655
September 9-11, 2005
Adams Mark Hotel Kansas City, MO
POC: Phil W. Johnson, 5519 147th Ave. NE, Forest River,
ND 58233-9604
Phone: (701) 248-3759 E-mail: philjohn@ivisimax.com

USS TUNNY SS/SSG/APSS-282
September 14-18, 2005
Clarion Airport Hotel, Charleston, SC
POC: Lee Ashcraft (508) 699-0931

USS CLAMAGORE (SS-343)
60th Year Celebration
October 19, 2005-October 23, 2005
Patriot's Point, Charleston, SC
cvanews.org
POC: President: Robert Dewar 904-428-2247
Vice President: Danny Williams 313-565-8682
Treasurer: George Bass 352-332-9753
Secretary: Chuck Staebler 502-266-5733

USS STONEWALL JACKSON SSBN-634
October 19-22, 2005
Groton Motor Inn, Groton, CT
POC: Jeff Morris (972) 298-8807
e-mail: jeffmorr@mindspring.com

USS ALEXANDER HAMILTON SSBN-617
October 19-23, 2005
Holiday Inn, Mt. Pleasant, SC
POC: David "No Neck" Moeller
2894 Fernwood Drive, North Charleston, SC 29406
(843) 553-2775 E-mail: whiskey58@comcast.net

USS GROUPER SS/AGSS-214
October 28-29, 2005
Galeston, TX
POC: Robert Guliver (281) 242-0515 E-mail: rojogull@aol.com

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NAVAL SUBMARINE LEAGUE

COMPARATIVE STATEMENT OF FINANCIAL POSITION

	31-Mar-05	31-Mar-04
ASSETS		
	$ 17,073	$ 76,640
	27,828	44,955
Restricted Cash	0	0
Investments at Market	403,386	291,253
Prepaid Expenses	6,520	10,776
Accounts Receivable	7,500	668
	$ 462,307	**$ 424,292**
Furniture & Computer Equipment	36,359	36,359
Office Condominium	251,021	251,021
	287,380	287,380
Less Accumulated Depreciation	(129,637)	(121,276)
	$ 157,743	**$ 166,104**
	$ 620,050	**$ 590,396**
LIABILITIES		
Accounts Payable	$0	$ 983
Deferred Income	62,288	87,680
Deferred Membership Dues	77,441	103,048
Rental Deposit	675	675
	$ 140,404	**$ 192,386**
Deferred Membership Dues	**176,526**	**133,435**
	$ 316,930	**$ 325,821**

NET ASSETS

UNRESTRICTED

Undesignated	281,970	243,425
Board Designated for Equipment	21,150	21,150
	0	0
	$ 303,120	$ 264,575
Total Liabilities and Net Assets	$ 620,050	$ 590,396

ETERNAL PATROL

Mr. John L. Helm
Mr. Robert n. Lindsay
RADM Thomas A. Meinicke, USN(Ret)
LCDR Benton E. Reams, USN(Ret)
CDR Robert Guy Pearce, USN(Ret)
RADM, MC Walter Welham, USN(Ret)
RADM E.T. Westfall, USN(Ret)
CDR Peter R. Bozzo, USN(Ret)
CAPT Floyd R. "Bob" Mock, USN(Ret)
CAPT Charles Coleman, USN(Ret)
CDR Louis W. Nickold, USN(Ret)

IN MEMORIAM TO
CDR ROBERT G. PEARCE, USN(Ret)

CAPT R.W. Hamom, USN(Ret)
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Dr. Eugene P. Haddock
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Mr. & Mrs. William H. Wilson
Mr. & Mrs. John Brocks
Ms. Sally Sample Graves

2005 DOLPHIN SCHOLARS

This year the Dolphin Scholarship Foundation will fund 133 Scholarships, including 28 new recipients. Each grant will be $3,000, totaling $399,000 in scholarship monies. Of the 28 selected, 21 were high school seniors and 7 were college students; 7 male and 21 female. 10 sponsors were active duty, 13 retired, and 5 discharged. 19 of the sponsors were from the enlisted community and 9 were officers. Congratulations again to the new ***2005 Dolphin Scholars!***

STUDENT	SPONSOR	HOME STATE
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Christi C. Bell*	BMCS(SW) Hugh C. Bell	GA
Sarah E. Brandeau	CDR John F. Brandeau	NE
Erin J. Brock*	EMCM(SS) James K. Brock	FL
Cory M. Buckley	ETCS(SS) Brandon L. Buckley	SC
Samantha L. Churchill	EMCS(SS/DV) David C. Churchill	WA
Zachary J. Coffman	LT Thomas P. Coffman	SC
Jeffrey J. Cooper*	STSCS(SS) Ricky F. Cooper	NC
Andrew N. Crandall	MMCS(SS) Roger L. Crandall	WA
Zachary C. Daniel	CSC(SS) Faron L. Daniel	NC
Sasha J. Ernest*	ETCS(SS) Shawn P. Ernest	VA
Kathryn D. Eyraud	STSCS(SS) Guy M. Eyraud	WA
Meghan L. Granito	MMCM(SS) Stephen P. Granito	WA
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Robin S. Miller	LCDR Michael W. Miller	IL
Amanda L. Murray	FT1(SS) Christopher J. Murray	VA
Chelsea A. Proulx	EMC(SS) David A. Proulx	CT
Eric R. Roeske	CAPT Ernest J. Roeske	VA
Amanda K. Stevens	MMC(SS) Willie C. Stevens, Jr.	NC
Sabrina R. Stone	FTG1(SS) Randall A. Stone	ID
Kelly A. Sullivan	CAPT Sean P. Sullivan	CT
Kerri L. Wadzita	CAPT George M. Wadzita	VA
Amber N. Walker*	MMCM(SS) James R. Staggs	GA
Shayna F. Worthen	FTC(SS) Kenneth D. Worthen	WA