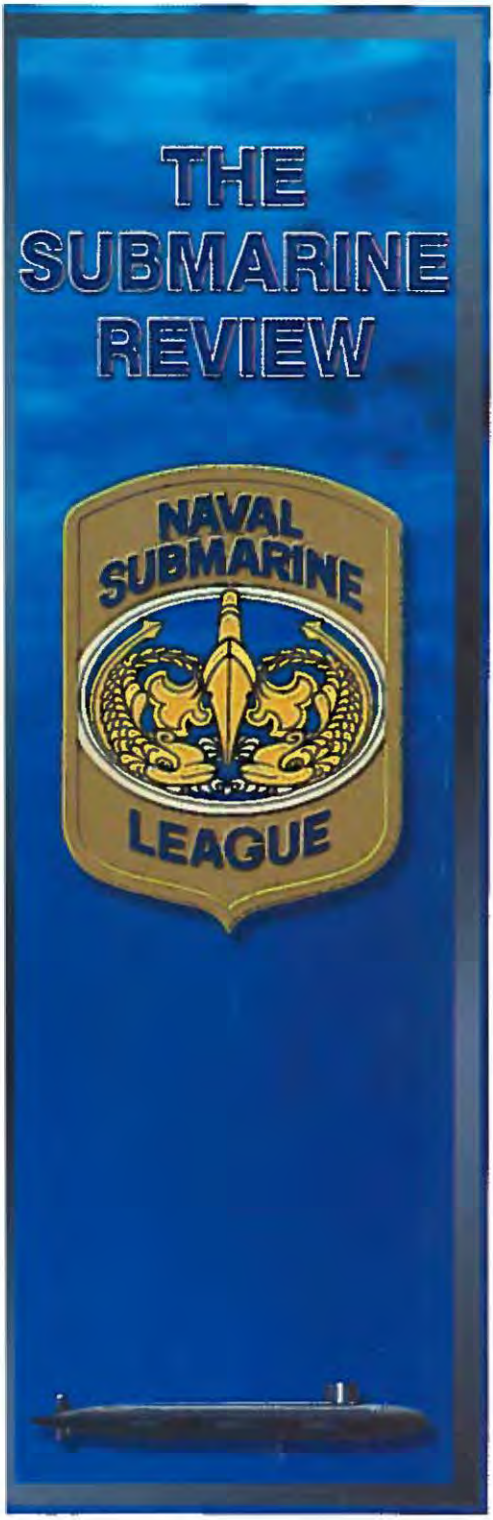

JANUARY 2008

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EDITOR'S COMMENTS

The SPECIAL FEATURE in this issue is from Rear Admiral William Hilarides, the Program Executive Officer for Submarines, on behalf of the entire submarine acquisition community. The subject is two-fold; the Initial Operational Capability certification of the SSGN class and significant headway in **reducing the cost** of VIRGINIA-class follow-on production. Those are two very commendable achievements, especially in these *twin budget-problem times* of escalating prices and the needs of war in the middle east. The human organization, talent and determination underlying those achievements represent a profound statement about what can be done under tough circumstances–if it is done right. Admiral Hilarides rightly gives full credit to everyone involved in what he calls the *Navy-Industry Partnership,* and that includes designers, builders, suppliers, operators, inspectors, contract folks and a knowledgeable requirements base. All of those people, civilian and naval, governmental and industrial, policy level and deck plate level, working together in a seamless organization are responsible for these two accomplishments.

Giving special consideration to the second accomplishment mentioned by Admiral Hilarides, reduction of VIRGINIA-class acquisition costs, should also be done in terms of overall *force structure costs*. Normally, in the defense appropriation business, the original price to be paid for a piece of capital outfit, like a ship or plane or tank, is a big consideration in judging how many of each platform can be purchased. It could be argued that operational need is always the driving factor in force structure calculations, but at least in the case of the VIRGINIA class the Navy has specifically decreed a ceiling cost as the constant in the force structure development equation.

Original price, however, is not the total cost to the nation for ownership of a capital investment platform. Life cycle costs, which includes fuel to run the platform and people to operate it, can amount to a lot of money. The costs for life cycle as well as the acquisition make up most of the *total force structure costs,* but that total does not seem to be a prime consideration in setting the number of platforms acquired for a given force. As much as *total force costs*

should be quantified in the authorization/appropriation process, it would seem an even more meaningful measure of effectiveness than that would be to have some unit of usage per dollar for the policy makers to consider. Admiral Hilarides specifically addressed that usage per dollar concept in noting that the production improvements will also result in at least one additional deployment over the lifetime of the submarine.

The **reduction in acquisition costs**, plus the already advantageous *life cycle costs* of nuclear submarines, with lower fuel and manpower requirements, and then an increased *usage per dollar* factor will make submarines even more attractive to the national leadership for the **increase in cost effectiveness**, in addition to the well known mission effectiveness.

RADM Jerry Holland, in his article LCS: A Danger Signal for Shipbuilding, uses the example of the Royal Navy's problem with building HMS ASTUTE to illustrate a number of conditions which could be contributing to the problems in the Littoral Combat Ship program.

The huge difference which Admiral Holland highlights between the USN's VIRGINIA-class building program and the RN's ASTUTE program is the total, knowledgeable, responsible organization of what RMDL Hilarides calls his *Navy-Industry Partnership*. To the extent the LCS problem mirrors the ASTUTE problem in over-dependence on the prime contractor without proper government participation, the submarine community might well be concerned that Navy corrections could over reach in both scope of the acquisition programs effected and depth of controls imposed. RADM Holland also cites the RN's long hiatus in submarine building as a major part of the ASTUTE problem. US submarine builders have long been warning of the possibility of such a loss of talent in our organizations should we allow a major break in the flow of design and building. The danger, of course, is magnified in the US case by the complexity of the problem and the size and timing of the *force structure* requirements.

Another facet of the modern submarine world is illustrated by Captain Sam Tangredi's article on Submarine Force involvement in the Navy's International Programs. His view is a particularization of the concept of the *1000 Ship Navy* and the need for American forces

to assist in the professional evolution and interoperability of our allies. US submariners have long recognized the need for improved interoperability with our allied Submarine Forces. The 2007 Submarine Technology Symposium at Johns Hopkins' Applied Physics Lab provided a wonderful opportunity to examine some of those needs. In the Mediterranean, around South America, in the Pacific Rim in the Arctic and elsewhere we have been an active participant in multi-national exercises and have seen the benefits to be gained from both close operations and the expansion of available numbers. The Secretary of the Navy's renewed emphasis on *relationships, not sales,* and a prioritized needs-based approach to cooperative evolution should be a very welcome assist in furthering those relations.

Jim Hay
Editor

FROM THE PRESIDENT

2007 has been another great year for the Submarine Force! Submarine Force Commanders are making every effort to keep submarines on station in forward operating areas. Unfortunately, submarine assets do not match the demand. There are just not enough submarines. Admiral Donnelly reported at the Annual Symposium that up to 25% of the requests for submarine forward support are not being fulfilled. Yet there is much good news. The great material condition of the submarines supports the current operational requirements. Recruiting is meeting the quotas set by the Navy, with a significant increase in accessions from the Naval Academy. The Force Master Chief, Jeff Garrison, provides an excellent report on personnel issues in this edition of the Review. NORTH CAROLINA (SSN 777) is next in line to be delivered following her successful sea trials. The Navy and industry have been making steady progress in delivering ships on time and budget. Congress has rewarded this performance by including $588M in the FY08 budget for advanced procurement of components enabling an increase in build rate to two submarines per year.

Your Naval Submarine League completed a full and profitable year. All services were provided within budget. The League's financial status continues to improve. The Annual Symposium was a big success in the new venue of the McLean Hilton at Tysons Corner. Attendance was the same as last year. Please note in your calendars that the dates for next year's symposium are 22-23 October 2008 at the McLean Hilton.

The Board of Directors had an infusion of new leadership with Admiral Rich Mies becoming the Chairman and four new board members. We welcomed Dr. Ed Liszka, Mr. Winfred Nash, VADM Stan Szemborski and Mr. Tom Vecchiolla to the Board at the Annual Symposium meeting. Mr. John O'Neill was also elected to a second term. Your Board continues to provide strong leadership and direction for the League and supports the many initiatives that you see each year. A technology update of the office computer systems was completed courtesy of one of the Board members. Others provided support of the Annual Symposium through their exhibits, sponsoring breaks, receptions and corporate tables. Industry

members of the Board, in conjunction with the corporate benefactor program, support much of the League's overhead costs.

I am pleased to report that the major events for 2008 are progressing well. The draft agenda for the Corporate Benefactors Recognition Days includes Admiral Donald, VADM Donnelly, RADM Walsh, and others who are currently in transition. This event is designed to thank the Corporate Benefactors for their support of your League.

The Annual Submarine History Seminar will be 10 April 2008 at the Navy Memorial. The topic is ***"Fifty Years Under The Ice"***, featuring a look at the scientific, strategic and operational aspects of submarine arctic operations. Speakers include VADM Ken Carr, a member of the NAUTILUS crew that made the original polar transit, CAPT Merrill Dorman, and CAPT Robert Perry, with CAPT George Newton as moderator. It should be an interesting evening concluding with the celebration of the Submarine Force Birthday.

The Submarine Technology Symposium will be 13-15 May 2008 at The Johns Hopkins University Applied Physics Laboratory. The theme is ***"Assure, Dissuade, Deter... Through Innovative Submarine Technologies"*** and promises to be another outstanding event. The session topics will include the SSGN, Tactical Survival, Force Needs, Technologies for Strategic Flexibility and Future Technologies. Admiral Eric Olsen, Commander Special Operations Command, will return as the banquet speaker along with the Force Commanders and others.

The fall Annual Symposium will be the same format as this year. We anticipate that the Submarine Force Cocktail Party will be the social event on the first evening. I encourage you to support this event. It is conducted for you by the League to keep you abreast of current submarine activity and capabilities.

RADM Cecil Haney will relieve shortly as Director, Submarine Warfare. We look forward to working with him and the entire Submarine Force leadership team to promote the Force as they meet current and future demands with diminishing submarine assets.

THE SUBMARINE REVIEW provides the forum for discussing topics of interest to the Submarine Force. Jim Hay consistently publishes a quality journal each quarter with timely and relevant articles about issues important to the Submarine Force. Seize the

opportunity to express your views on subjects important to undersea warfare.

2007 saw the passing of two Submarine legends; Admiral Bill Crowe, former Chairman of the Joint Chiefs of Staff and RADM Gene Fluckey, the last of the WW II Submarine Medal of Honor awardees. Their contributions to this nation are enduring.

Jan joins me in wishing you a very Happy, Healthy, Prosperous and Joyful New Year.

J. Guy Reynolds
President

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NAVAL SUBMARINE LEAGUE - Box 1146 - Annandale, VA 22003-9146
(703) 256-0891 Fax (703) 642-5815 E-mail: subleague@cavtel.net
Web Page: www.navalsubleague.com

SPECIAL FEATURE

A BANNER YEAR FOR SUBMARINES

by RDML William Hilarides,
Program Executive Officer, Submarines

It's good to be the Program Executive Officer for Submarines. Over the past year, we enabled a number of successes that are crucial to the Submarine Force's continued dominance. Our achievements range from deploying the first of the newly-converted SSGNs into the Pacific Ocean, to making significant headway in reducing the acquisition cost of the VIRGINIA Class so that we can transition to buying two for $4 billion as measured in Fiscal Year (FY) 2005 dollars in FY 2012. In my opinion, the coming years are the right time to begin investing in new technologies for the next-generation of submarines in the Navy's 30-Year Shipbuilding Plan. We have demonstrated our ability to perform and I believe that we can utilize the Navy-Industry partnership that has been so effective in both the SSGN and VIRGINIA Class programs to help ensure our undersea preeminence for decades to come with a generational investment in technology.

USS OHIO's (SSGN 726) first operational deployment is the Submarine Force's most publicly-visible achievement. At the Naval Submarine League's Annual Symposium on 1 November 2007, I signed the class's Initial Operational Capability document, meaning that the class is now ready to assume its intended role in the Fleet. Later that month, OHIO began its first operational patrol in the Pacific Ocean. The ship will spend a full year forward deployed, conducting three crew turnovers.

The SSGN Program has been a model for execution of a complicated program within budget and schedule constraints. Since receiving its first SCN funding in FY 02, the SSGN program has performed almost exactly to schedule. In FY 02, the Navy estimated that the entire SSGN Program would cost $4.052 billion and with the last boat nearing completion we now estimate the final cost at $4.095 billion—a difference of 1 percent. Also in FY 02, the Navy estimated that we would need a total of 131 months to convert all four boats. With GEORGIA's December 2007 delivery we have taken

134 months, a 2 percent increase. The SSGN Program's ability to stay so close to the five-year old budget and schedule estimate is a testament to all of the people from the Program Office, Naval Reactors, the Naval Sea Systems Command, Strategic Systems Programs, NAVAIR, Norfolk and Puget Sound Naval Shipyards, and General Dynamics Electric Boat who executed these four refuelings and conversions. Without a doubt, they have provided the Navy with powerful platforms that will be in constant use for the next two decades.

Much has been said about the SSGN's Strike and Special Operation Forces (SOF) Payload, and rightfully so. Each SSGN can carry up to 154 TOMAHAWK land-attack cruise missiles, 66 SOF and the gear and equipment needed for sustained operations. Additionally, the forward-most missile tubes are now lock-out chambers that are capable of mounting either a Dry Deck Shelter or the Advanced SEAL Delivery System (ASDS). See Figure 1

With little fanfare, though, we installed some of the same fire control, sonar system, and electronic warfare suites found on the latest-generation SSNs. We also installed a photonics mast and Integrated Submarine Imaging Systems so that the SSGNs will have the same above-water optical sensors as the VIRGINIA Class. The SSGNs also have the Common Submarine Radio Room along with two high-data rate antennas that allow for unparalleled connectivity. We installed a Battle Management Center that can serve as a Small Combatant Joint Command Center—something that was proved during multiple Sea Trial Experiments. With the upgrades to their fire control systems, the SSGNs will also be able to employ the latest Mk 48 variant, the Advanced Capability, Common Broadband Advanced Sonar System. This fully digital weapon has been designed to be the dominant littoral torpedo while still retaining deep-water capability. So, while the most people have been focusing on the SSGNs' Strike and SOF capabilities, we have further enhanced these ships by fully modernizing their Submarine Warfare Federated Tactical Systems (SWFTS) with the latest software and hardware available.

The Virginia Class Program has experienced as much success as the SSGN. On May 5, 2007, the Navy commissioned USS HAWAII (SSN 776), the third of the class behind USS VIRGINIA (SSN 774)

Figure 1

and USS TEXAS (SSN 775). HAWAII also successfully completed the Operational Evaluation (OPEVAL) for its lock-out trunk in November 2007. Additionally, the Navy christened NORTH CAROLINA (SSN 777) on April 21 and laid NEW HAMPSHIRES' keel on April 30.

This cycle of commissioning, christening, and keel laying will continue into 2008 as NORTH CAROLINA will commission on May 3 while the Navy will christen NEW HAMPSHIRE on June 21

and lay NEW MEXICO's keel on April 12. 2008 will also see the continuation of the Virginia Class' OPEVAL program with USS VIRGINIA carrying out the Anti-Submarine and Anti-Surface Ship, mine avoidance, battle group support and strike portions with USS TEXAS conducting the DDS trials. The Program Office and the Fleet expect to complete OPEVAL in early 2009 with Milestone III coming soon after.

The Virginia Class Program Office is also working on a Request for Proposals for a seven-ship Multi-Year Procurement (MYP) Contract with Economic Order Quantity (EOQ). This Block III contract is scheduled for award in December 2008 and is a key effort to reach the CNO's mandate for buying 2 Virginia's for $4 billion (as measured in FY 05 dollars) in FY 2012— **or 2 for 4 in 12.**

To make **2 for 4 in 12 a reality**, the Virginia Class Program established a three-element strategy to reduce cost by $400 million per hull. *See Figure 2.* The first element involves securing authorization from Congress for the seven-ship MYP contract with EOQ for

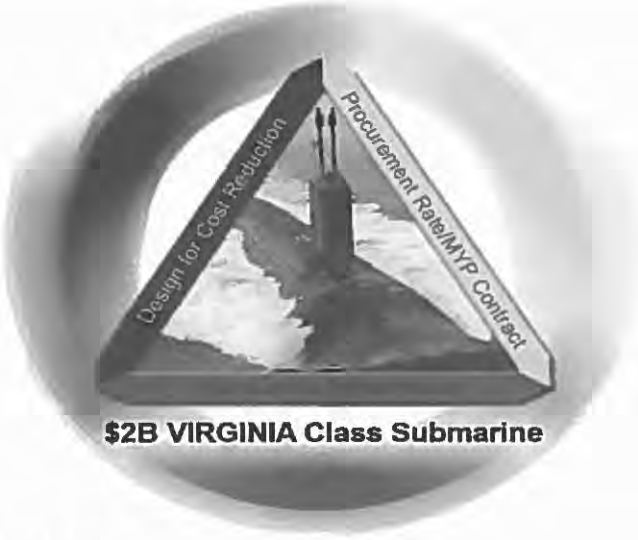


Figure 2

the Block III submarines. That alone provides approximately $200 million savings per ship starting with the FY 12 hulls due to EOQ and the spreading of overhead across two hulls. Both the FY 08 Appropriations and Authorization budgets approved the Navy to negotiate an MYP contract, so we are half way to our cost-reduction goal. *See Figure 3.*

The second cost-reduction strategy involves improving construction performance from the 84 months for USS TEXAS to 60 months for future Virginia class hulls. A key aspect in this effort includes streamlining the construction process. For example, by repositioning the Lightweight Wide Aperture Arrays off of hull butts, the shipbuilders are able to reduce Virginia class' construction span by five weeks. We are removing two weeks of construction time by modifying how we build and test the weapons module and saving another two weeks by eliminating the post Bravo Sea Trial dry docking period.

The Navy and shipbuilders have also taken steps to reduce the time to build the Lock-Out Trunk by six weeks and the sail construction by four weeks. We have modified the torpedo tube shutter door plating for a savings of four weeks on that specific task and we repositioned the engine room collecting tank to save two weeks on that construction element. While these modifications do not provide a one-for-one savings on the total ship, they do allow the shipbuilders to redeploy workers to other areas quicker and the trickledown effect is that ships complete earlier.

The Navy took an important step in reducing the construction span with the Block II contract awarded in FY 03. In that contract, the Navy set aside $91 million for a Capital Expenditure Program that provides money to our shipbuilding partners for infrastructure improvements that will reduce construction costs over the life of the Virginia class program. To date, the Navy has approved eight CAPEX projects and spent a total of $61 million. For this investment, the Navy has removed approximately 4.8 million man hours of work from the remaining twenty hulls and avoided costs of $412 million over those hulls—a seven-to-one return on investment.

Due in large part to construction-span streamlining and the CAPEX program the Virginia Class Program Office estimates that NEW HAMPSHIRE (SSN 778) will complete six months early to its

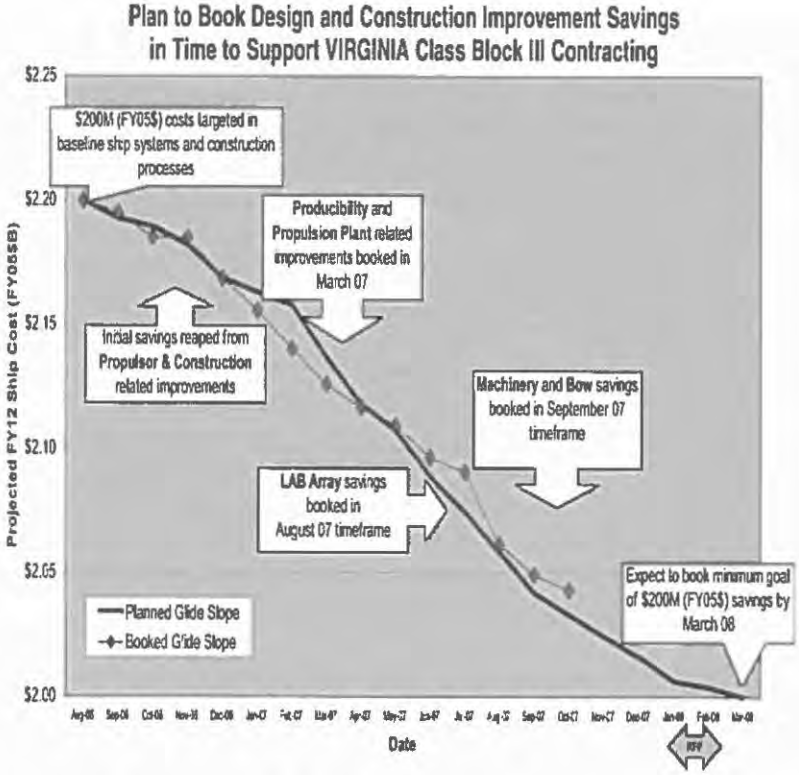

Plan to Book Design and Construction Improvement Savings in Time to Support VIRGINIA Class Block III Contracting
$2.25
$2.20
$2.15
$2.10
$2.05
$2.00
Projected FY12 Ship Cost (FY05$B)
$200M (FY05$) costs targeted in baseline ship systems and construction processes
Producibility and Propulsion Plant related improvements booked in March 07
Initial savings reaped from Propulsor & Construction related improvements
Machinery and Bow savings booked in September 07 timeframe
LAB Array savings booked in August 07 timeframe
Expect to book minimum goal of $200M (FY05$) savings by March 08
Planned Glide Slope
Booked Glide Slope
Date
RFP

Figure 3

contract delivery date for a total of 71 months to build. The construction span for NEW MEXICO (SSN 779) is currently estimated at 65 months, making its delivery six months early to the contracted delivery date of April 2010. The ship authorized in FY 08, the unnamed SSN 783, will take only 62 months to build, meaning that between now and FY 12 we will have to shave only two additional months off of our current construction plan. Given the past performance of our Navy/Industry team, it is very likely that we will be able to find those two months and therefore meet our goal of a 60-month construction span.

The third and final element of the Virginia-Class cost-reduction strategy involves redesigning portions of the submarine to reduce both component and construction costs. The Navy's shipbuilding partners have provided hundreds of design for affordability suggestions, several of which we have implemented. One of these design changes involves the electrification of the torpedo room. By replacing all of the torpedo room's approximately 65 hydraulic actuators with electromechanical components, we will eliminate more than half a mile of hydraulic piping and all of its associated welds, valves, filters, restrictors, hangers, and reservoirs for a savings of $3.2 million, as measured in FY 05 dollars, on the FY 12 ships.

Another design change involves modularizing the lock-out trunk (LOT). By building more of the trunk off-hull and modifying its design, the Navy will be able to save $500,000 in FY 05 dollars per hull starting with the ships authorized in FY 12.

As part of the redesign for cost reduction effort, the Navy and its industrial partners re-evaluated some traditional submarine building beliefs. In doing so, we determined that we could reduce the amount of damping material in the forward parts of the ship and use a different, less expensive, material. This design change is being implemented on the last two boats of the Block II contract, SSN-782 and SSN-783, and will save $4.4 million in FY 05 dollars on the FY 12 ships.

As part of this reevaluation, the Navy determined that it could save $60 million, as measured in FY 07 dollars, per ship by eliminating Post-Shakedown Availabilities (PSA). In doing so, the Navy may be able to secure an extra deployment per hull and it will

minimize non-propulsion electronic systems obsolescence by deferring upgrades until after the ships' first deployment. The $60 million, though, does not count toward the cost reduction effort. However, eliminating the PSA saves the Navy a considerable amount of money, and it looks to provide our operational forces with an extra deployment per submarine. It is the right thing to do for the Navy.

The cost reduction program's most dramatic effort involves the nearly complete redesign of the ships' bow. This new "bow bundle" replaces the traditional transducer-covered sonar sphere with a water-backed Large Aperture Bow (LAB) Array populated with hydrophones along with a small active array. In making this change, we are eliminating one of the submarine's most difficult-to-build and therefore costly components with a non-SUBSAFE array that offers improved passives, though slightly reduced active, capabilities. Additionally, the LAB Array will utilize proven hydrophones that are designed to last the life of the ship—current VIRGINIA Class transducers will have to be replaced at the ships' half life.

The other key component to the bow bundle is the removal of the twelve Vertical Launch System (VLS) tubes and installation of two VIRGINIA Payload Tubes (VPT). The VPTs are the same diameter as the TRIDENT missile tubes found aboard the OHIO Class and will utilize the same Multiple All-up-round Canisters (MAC) as the SSGNs with the only difference being that the VPTs will hold up to six TOMAHAWK cruise missiles instead of the SSGN's seven to allow access into the canister. With this one change we are nearly doubling the bow's payload capacity from 1,200 cubic feet to 2,300 cubic feet and the VPT-equipped VIRGINIAs will be able to carry all of the MAC payloads that the Navy puts aboard the SSGNs. *See Figure 4.*

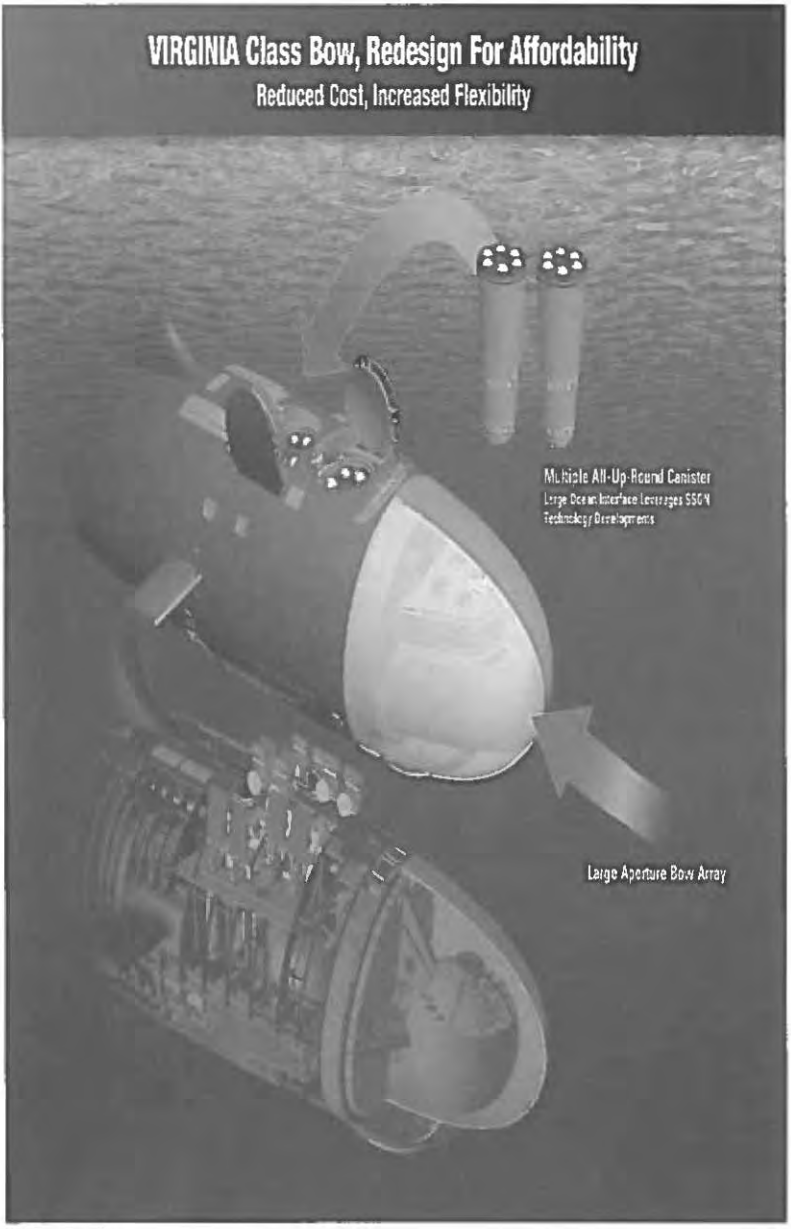

VIRGINIA Class Bow, Redesign For Affordability
Reduced Cost, Increased Flexibility
Multiple All-Up-Round Canister
Large Ocean Interface Leverages SSGN
Technology Developments
Large Aperture Bow Array

Figure 4

The bow bundle, coupled with an additional twenty-five associated changes, are estimated to save the Navy $40 million, as measured in FY 05 dollars, on the FY 12 submarines. It is important to note that the design changes discussed above will all go aboard SSN 784, the first of the Block III VIRGINIAs that will begin construction with the signing of the next contract likely in December 2008. However, the cost savings will not be realized until the FY 12 ships. The Navy is asking the shipbuilders to make changes to a mature design and that will require readjusting the learning curve. By FY 12, we fully expect the Navy to order two VIRGINIAs for $4 billion as measured in FY 05 dollars.

The VIRGINIA Class cost reduction program has been a success by any measure. During this process, we began to realize that the Navy had the opportunity to leverage the great work being done reduce VIRGINIA's costs to start attacking technological barriers that could greatly enhance future submarines' capabilities. In the near future, the Navy could be in a position to invest in ideas that could revolutionize future submarines' littoral stealth and provide them with advanced sensors and payloads, improved transit stealth, and the ability to integrate off-board sensors. These are not near-term possibilities and will likely require significant time and financial investments. As we have seen in the past, we must continuously evaluate, protect, and pursue our asymmetric advantage in all things ASW and USW. The United States needs to dominant the undersea battlespace, and to do that we need to retain our technological edge.

As I said, it is good to be the Program Executive Officer for Submarines. The Submarine Force is in the midst of a revolution with both the SSGN and VIRGINIA Classes entering the fleet and, for the OHIO, making their first deployment. We are also in an excellent position to fulfill the CNO's mandate for 2 for 4 in 12 and our workforce and industrial partners are aligned to meet the needs of the Navy by fulfilling the 30-Year Shipbuilding Plan. Starting in 2002 with the SSGN Program and then the VIRGINIA Class Cost Reduction Program in 2005, the submarine acquisition community has been presented with a number of challenges and in each case we have succeeded. We are now looking forward to continuing our success with whatever the future may hold.■

EULOGY

EULOGY FOR ADMIRAL WILLIAM J. CROWE
U.S. NAVAL ACADEMY, ANNAPOLIS, MD
BY
ADMIRAL MIKE MULLEN
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
OCTOBER 31, 2007

Bill Crowe once said the greatest joy a human being can know is the ecstasy of completing a job well done. I would add, of living a life well-lived. And Bill did just that; as a husband, a father, a grandfather, a sailor, and a statesman.

Today we gather here on this yard, under this dome, and in our own hearts say farewell to a shipmate, to honor his noble service to our nation, to remember the life he led, the smiles he shared, and the indelible mark he left upon everything and everyone he touched. We do so with great sadness and yet also with great gratitude, thankful to the core that we even knew him, for the time he gave us, the wisdom he shared, the many warm memories he left us, and the lessons he taught us.

For Bill Crowe's life was a life of purpose and consequence. It was a life of learning and thinking, of study and teaching. It was a life of love and laughter. It was a life of great courage. And he was fearless. He was never afraid to engage new ideas in his relentless pursuit of doing what was right, of being who he was and stating his beliefs. He was also never afraid to admit or to discover that he was wrong, never afraid to laugh at himself when he did. He knew he'd never find all the answers. That was fine with him. He didn't need to. It was the questions that drove him, that kept him engaged, that pushed the rest of us to dig deep when we wanted to dig in. He was fond of saying the mind is like a parachute. It only works when it's open. And his was wide open. Always.

He was an Okie. I think that's been established. And he was darn proud of it. You didn't have to talk to him very long before you knew that. Oklahoma sports, Oklahoma culture, Oklahoma food.

And, of course, people drew him in, excited him, made him homesick.

I actually remember not too long ago walking into a restaurant in Washington with my wife, Deborah, for lunch. Just inside the door was Bill at a table with about ten ladies all wearing big red hats and even bigger smiles. I think it's called the Red Hat Society. Bill's hat was the biggest. And he was grinning like a possum who'd just eaten a sweet potato. I'm not sure what made him prouder; that he was surrounded by so many lovely women, which included his wife, Shirley, of course, or that he was surrounded by so many lovely women who happened to say they were Sooner fans.

I made the mistake once of telling him I was from California. You can imagine where that one went with jokes about my IQ.

You just couldn't get the best of him. He was always at least two steps ahead of you. You could see it in his eyes; that certain twinkle that told you he was figuring things out in his head even while you were finishing what you were saying.

For a man who because of bad knees had trouble getting to his feet, he sure never had any trouble thinking on them once he was up.

He was a great American. And I don't mean that in the overly simplistic or even solely military manner. Oh, he certainly had the medals and the credentials to justify his patriotism. Commander of a submarine, riverine operations during the Vietnam War, leadership of all our forces in both the Mediterranean and the Pacific. And he'd seen the ugly side of war and helped preserve a fragile peace. He was every bit the warrior statesman this country needed in the wake of World War II.

Bill Crowe served in, no, he really helped define a time of incredible change. A true scholar, he applied his intellect to advise three presidents and served as a bridge between the Cold War and this new era. He was a Sailor of vision who focused our Armed Forces to think and operate jointly. And he was a remarkable diplomat who understood the power of relationships.

You couldn't have a better friend. His personal bond, the relationship he established with Soviet Marshall Sergei Akhromeyev was legendary. But it wasn't just the relationship; it was the friendship that had the power to shake at the foundations of the global order of that time.

But it is not what you saw when you looked at him in his uniform, or looked at his service record, or even what you read about in the headlines that made him a patriot. It was his loyalty that set him apart. He understood the power of giving oneself over to a greater cause. Shipmate, ship, self was not just a slogan he learned here in Bancroft Hall. It was the code by which he lived. He also understood better than most that true loyalty was neither blind nor deaf nor mute. It always looked for, listened to, and spoke the truth. It was rooted in moral courage. Loyalty, in Bill's view, was not simply saluting and following orders, though he certainly understood that was a big part of it. To him it meant a willingness to stand up, speak your mind, even if doing so cost you your job. That's what made him such a terrific naval officer and Chairman of the Joint Chiefs of Staff. And I'd be less than honest if I said it isn't also one of the reasons I continue to admire him so much.

On the day those airplanes smashed into the World Trade Center and the Pentagon, changing our lives forever, Bill Crowe was here at the Academy doing what he loved; teaching our future leaders. Some of his young students were flooded with emotion; shocked, outraged, even stating they wanted revenge. He cautioned them. He asked them to consider what America needed them to do right now. He let them ponder that question for a moment which was, itself, the answer. Think, he said. You're military people. You're supposed to sit down and think calmly. You must divorce yourself from the emotions and use your head.

It was much the same advice he gave me as I prepared for my current assignment. He also warned me, and this will come as a shock to no one, to not take myself too seriously.

I remember going to sit with him a few weeks ago at the hospital and there on the nightstand stood, probably 18 inches high, a stack of books that he had every intention of pouring through. He wanted to read, to learn. And if he read it, it must be worth knowing.

He passed on his love of learning to his family and was never more proud than when he talked about their studies, their pursuits and their accomplishments, especially those of his granddaughters; Amanda, who as a Plebe here is following in her grandfather's footsteps, and Caitlyn who's paving her own way at Georgetown.

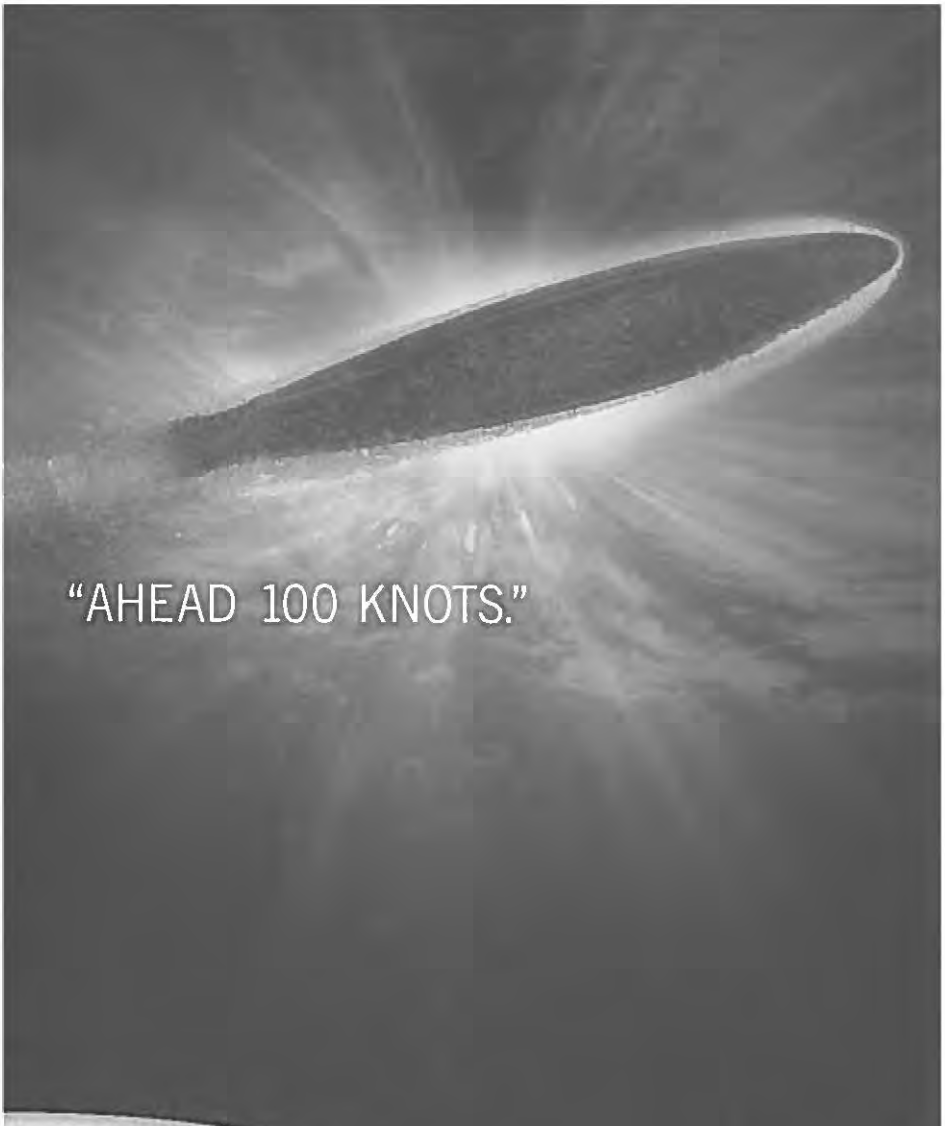
Bill was, is, and forever will be remembered as a faithful public

servant, a towering example of integrity, and an inspiration to generations of Americans, as I am sure he has been an inspiration to each of you here today.

Let me take just a minute to acknowledge someone who has been an inspiration to Bill, his life partner, his soul mate, the love and light of his life, his wife, Shirley.

Over the years, I have witnessed Bill and Shirley's dedication to each other, dedication to the families of those who wear the uniform. Through their mere presence together or even in the simple acts of walking their dogs, they shared an unspoken language between a husband and a wife that endured and matured and was an eloquent and loving exchange and an eternal example for us all. Shirley, I know that you challenged Bill's thinking as much as he challenged ours. And we are grateful for that. Bill was who he was and did what he did in no small measure because of how you loved and supported him for over 53 years. You made his service possible. You are an inspiration to all of us. And Deborah and I thank you, as do the families of all our service men and women, those who are serving now and those who have served before. We thank you from the bottom of our hearts.

Yes, Bill gave his time, he shared his wisdom, and left us with many fond memories. The time has now gone, we can't get that back, as much as we'd like to. But the wisdom and the memories remain, and those are things we will all hold onto. So today we bid farewell to a man who lived with purpose, who served with passion and who, above all, never forgot that, as he himself put it, a good sense of humor oils the gears of everyday life. We will sure miss him and that sense of humor. May God bless his soul, his family, his Navy, and the nation he loved so much and so nobly served.■



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FROM THE ANNUAL SYMPOSIUM

THE SUBMARINE FORCE TODAY
BY VICE ADMIRAL JAY DONNELLY
COMMANDER SUBMARINE FORCES
AT THE
NAVAL SUBMARINE LEAGUE SYMPOSIUM
OCTOBER 31, 2007

Editor's Note: Vice Admiral Donnelly made this presentation to the Symposium via a pre-taped video. This article is a transcript, by his staff, of the Admiral's talk on that video.

Admiral Mies, thank you very much, and to all the members of the Naval Submarine League, thank you for this invitation to speak to you today. As the Commander of Submarine Forces, I want you to know how much the Submarine Force appreciates the support from the Navy Submarine League.

I apologize that I couldn't be with you in person today. The good news from my perspective is that I won't have to answer any hard questions after I speak this morning. I will be joining you tomorrow, and I'll be there at the Submarine Leadership Round Table with Rear Admiral Grooms and Rear Admiral Hilarides.

But today I'm in Millington, Tennessee, at the two-star board, and I just couldn't arrange my schedule to be there with you.

This is my first time speaking at the annual symposium as the Submarine Force Commander. I did speak years ago as a submarine commanding officer on one of my deployment debriefs, but it is a great pleasure to be with you this morning.

I'd like to provide a status report of the Submarine Force. I've been in the job now nine months, and I feel we're making good progress on my three priorities. My first priority is operational excellence. The second priority is developing our people, and the third priority is maintaining the force and modernizing the future force.

Last week the Chief of Naval Operations unveiled the new maritime strategy to over 100 nations at the International Seapower Symposium in Newport, Rhode Island. My three priorities are closely aligned with this new maritime strategy. In fact, the Submarine Force, along with the rest of the Navy, the Coast Guard and the Marine Corps, was intimately involved with the development of this new strategy.

Why the change?

This new strategy stresses security and prosperity, which are vital interests to the United States. They are increasingly coupled to those of other nations. Our nation's interests are best served by fostering a peaceful global system comprised of an interdependent network of trade, finance, information, law, people and governments. Seventy percent of the world is covered by water, 80 percent of the world's population lives on or near the coastline, and over 90 percent of our commerce sails across the oceans. So any disruption of the maritime domain will have a direct impact on the American quality of life.

Preventing wars is an important concept, and as important as winning wars.

Our challenge as a nation is to apply seapower in a manner that protects U.S. vital interests even as it promotes greater international security, stability and trust. Submarines will play a critical role in this new maritime strategy.

We have a head start on the international relationships part that will be needed. We are already working with the Submarine Forces of 27 different nations, representing 224 submarines.

Through operations, exercises, mutual agreements and staff talks with our allies and partners around the globe, we continue to increase our interoperability and strengthen partnerships in the name of the U.S. national security, and to promote economic and political stability that secures the benefits of globalization for all maritime nations.

Another tenet of the maritime strategy is maritime domain awareness. That requires an accurate and timely intelligence, surveillance and reconnaissance system. It requires an enhanced maritime information sharing network, and the communications to support it. This will require an unprecedented level of integration

among our maritime forces, and enhanced cooperation with other instruments of national power, as well as the capabilities of our international partners.

In that light, USS OHIO deployed last week with a new joint collaboration capability called the Small Combatant Joint Command and Control Center, or SCJC2. Additionally, CENTRIX, which is a tool for sharing operational and tactical information with U.S. and coalition maritime forces will be added during the OHIO's first voyage repair period.

The submarine is the platform that will be called upon to operate in an anti-access environment where other forces can't go. And of course, strategic deterrence will remain a critical element of our national security.

So we're already hard at work achieving the operational excellence that will make us essential to the maritime strategy.

Though I'm not able to go into the specifics due to the classification level of this forum, I can tell you we have had a number of successful SSN deployments around the world. That's due in no small part to sharp commanding officers. You'll be hearing from one later, Commander Lauren Selby, the former CO of USS GREENVILLE. He's here to talk to you about what he did with the Advanced SEAL Delivery System on GREENVILLE.

We're also deploying to new areas of the world like the Southeast Atlantic, and other areas in the 5th Fleet where we haven't gone much before, deploying with new information sharing and intelligence gathering capabilities. USS MONTPELIER is in the final stages of her Pre-Overseas Movement work-ups, and she will soon be deploying with the TRUMAN Battle Group. We've equipped her with a high-frequency internet protocol communication system using her floating wire antenna. This will allow her two-way communications beyond the line of sight using HF, both transmit and receive, that will give her an e-mail, chat and electronic file transfer capability with other strike group platforms or aircraft while she's operating at speed and depth. This is our first step—it's a small step, but a good first step—towards communications at speed and depth, which is so vital as we participate in this new maritime strategy of the future.

We're also equipping MONTPELIER with an unmanned aerial

vehicle called the *Buster*. We tested the Buster in AUTEC last week, and I have some video I want to share with you here.

(Referring to video...) This video shows us launching the Buster from the surface. It's launched basically with bungee cords. Eventually we want to get to a submerged launch. This is Buster cruising at a thousand feet altitude, restricted to that height because of airspace restrictions. She would actually operate a little lower and have higher resolution on the camera.

This is an infrared camera image. In this image black is hot, and the white areas are cold. She's flying over the AUTEC range complex, and this image is beamed back to MONTPELIER 20 miles away. Here at the bottom of the screen, you can see the power plant with the smoke stacks which are the hot thermal image.

So that's the capability we hope to prove on her deployment, and then use that in an SSGN deployment in the future.

Speaking of that, SSGN is now a reality. Twelve years ago, the idea was developed to convert the first four of the Ohio Class to SSGNs. After my commanding officer tour I was assigned to the Pentagon and I was one of the briefers that pushed that PowerPoint concept around. Twelve years later, OHIO is on deployment and it was delivered on cost and on schedule. FLORIDA and MICHIGAN will deploy next year, and GEORGIA is nearing the end of her conversion and will return to service in March of next year—A remarkable achievement.

The regional Combatant Commander's (COCOM) demand signal for the SSGN is high, and OHIO will initially deploy to the PACOM Area of Responsibility (AOR). As you know, this part of the world is becoming an increasing area of concern and focus for the U.S. Navy. So SSGN is anxiously awaited, and will play an integral role in this new maritime strategy.

I have another video I'd like to show you from SSGN. This is taken of USS FLORIDA during the OP EVAL of her strike warfare assessment, which was done just this last summer.

(Referring to video...) In this video, you'll see the hatch opening. This is one of 22 of her large diameter missile tubes, and in that tube is a canister that holds seven Tomahawk missiles. It's called a MAC, or Multiple All Up Round Canister. This is a picture of a MAC, and you can see the seven Tomahawks. The center tube is being

launched. The tube contains a Block 4 Tomahawk missile, leaving the tube under impulse, and then exiting the tube. Those are cameras, installed for the test, topside—they'll be removed. There it is transitioning to boost phase and cruise phase as she heads down range. That was one of two block 4 launches, and both were successful.

The Virginia Class submarine is also off to a great start. Due to the high need for deployers, and the unprecedented achievement of the Virginia's new construction program, we were actually able to deploy VIRGINIA early with great success. Prior to her post-shakedown availability, we sent her down into the SOUTHCOM AOR. Commander Todd Kramer will brief you tomorrow on that deployment and his experiences as the Commanding Officer of the first ship of this newest class of submarine.

We've had a lot of success also in reducing the cost of the Virginia Class submarine, attaining what we call *two for four in twelve*—two submarines for 4 billion dollars in the year 2012. We're very optimistic that we may actually reach two submarines a year early, in 2011, and we're waiting for Congress to approve the budget that might make that a reality.

The Virginia Class bow redesign is also a recent development. One of the cost-cutting measures was to reduce or eliminate the sonar sphere and the sonar trunk which connects the sphere to the pressure hull. That enabled us to redesign the entire bow area. Instead of 12 vertical launch Tomahawk tubes in the first two blocks of the Virginia Class, we now will equip that ship with two large diameter tubes the same size diameter as our SSBNs and the SSGN —only 27 feet long. That will enable us great flexibility. We still have the same sonar capability with the conformal array that will be on the skin of the ship in the bow area. But with those large diameter tubes, many of the payloads that we will incorporate in the SSGN will be able to be incorporated in the future Virginia Class submarines. It it gives the force great flexibility for the future.

Rear Admiral Willie Hilarides will provide you more detail on the Virginia Class progress tomorrow. It really is a model for our shipbuilding program in the Navy.

Our SSBN force continues to be a vital part of the Submarine Force. Almost 40 percent of our operating personnel operate on

SSBNs. The demand for their service is still very high. I've been to both Kings Bay and Bangor recently, and the professionalism of those sailors is eye-watering. I have great confidence in their ability to operate their ships.

Ohio Class ships will, however, begin decommissioning in the year 2027, so planning for the replacement is underway now. The 30-year ship building plan calls for a 2019 construction start date, and if you back that up, that means we must commence design efforts starting in about 2014.

There is a Rand Corporation study recommendation that we begin design of the follow-on sooner than that. It's actually cost effective to have a more mature design when you start construction. So SECNAV has directed the R&D and capability assessment for the follow-on sea-based strategic deterrent. We're very excited about that. Now is the time to start, and Rear Admiral Bruce Grooms will speak more on that subject later today.

As you can see, we have a lot of success in my two priority areas of operational excellence and modernizing the future force. We're having the same success with our people. As Admiral Nimitz said, "Our armament must be adequate to the needs, but our faith is not primarily in these machines of defense but in ourselves." We've revitalized our emphasis on deck-plate leadership, and I think it's paying off.

We've had a 75 percent reduction in traffic fatalities from fiscal year 06. We're seeing a reduction in illegal drug use among the force, and a reduction in alcohol-related incidents. Now while this is only a modest success, we've had 13 crews go more than a year without a single member of the crew getting a DUI. USS ALEXANDRIA has actually gone for three years without any DUIs. We're sharing the things that these ships are doing right with the rest of the force so we can get every crew benefiting from their lessons.

I think it's the CPOs leading the way with strong leadership at the deck-plates who are primarily responsible for those successes. We're making a lot of progress and we're proud of what we have accomplished, but there are still many challenges ahead.

I have a high-demand and low-density asset. Last year we only met 56 percent of the COCOM demand signal for SSNs. The COCOM demand has actually been on the rise, and I think that trend

will continue for the foreseeable future. We have 52 fast-attack submarines, and the force is decreasing at the same time as the requirements are increasing.

Under the current ship-building plan, during the period from 2020 to 2034, we'll dip below 48 SSNs, which is the number of submarines we need to meet the obligated requirements to the COCOMs. And we'll reach a minimum of 40 SSNs during that period. So we're hard at work looking for ways to mitigate that. We're transferring six of our SSNs from the Atlantic to the Pacific Fleet to meet the surge requirements and establish a 60/40 split of SSNs between the Pacific and the Atlantic Fleets. *Two for four in 2012* with the Virginia Class will not be enough. We need to reduce the construction time to 60 months, accelerating boats to the fleet. We need to selectively extend SSN operating lives for the Los Angeles Class. And we need to lengthen the period between the depot availabilities for the Virginia Class submarine. We'll also need to look for a range of affordable and modular payloads that we can put in those large diameter tubes, both on the Virginia Class SSN and the SSGN.

The retention of our sailors and our junior officers is another challenge. Over the past three years, we've seen a steady decline in retention rates. We're making some progress to correct that trend. *Retention Deep Dives* is one way. We're using teams that are visiting the boats to help improve their retention. Reenlistment bonuses are at the highest levels they've ever been, with multiples of 10 for selected reenlistment, equating to $90,000 reenlistment bonuses for some of our sailors.

Recently, the declining sailor retention trends have been arrested across the board, and we're currently at or above CNO retention goals across all reenlistment zones. My new Force Master Chief, Master Chief Jeff Garrison, will provide you with more on this later today, and also he'll talk about the deck-plate leadership that our CPOs are providing, and the difference that's making.

Now we do continue to struggle a little bit with junior officer retention, and I'm watching that very carefully. What we're seeing are an unusually large amount of JOs resigning directly from their sea tour vice their follow-on shore duty. I've talked to the JOs about that and we're attacking that problem on a number of fronts. I've been listening to what their main *disatisfiers* are, and we're working

that problem hard.

Diversity is another area in the third priority that I'm working. It's a high CNO priority and we need to improve the diversity in the Submarine Force, especially among the officer ranks. Our diversity in the enlisted ranks overall is quite good, and actually is a mirror image of our society. But in the officer ranks, we have a ways to go. I've established a Force Diversity Officer, Lieutenant Commander Eric Mason. He's just taken the job, he's got lots of energy, and he's been coordinating visits to introduce the Submarine Force to diverse organizations on college campuses across the country.

Recently we talked to students at several universities in California, Georgia and Alabama. We will soon be visiting universities in New York. He's making a lot of progress, and we're reaching a lot of good potential candidates for the Submarine Force.

Commander Jerry Miranda, Deputy Director of the U.S. House of Representatives Navy Liaison Office, is a submariner, and he's also a member of the Navy Submarine League. He was recently recognized by the Hispanic Engineer National Achievement Awards Conference as a Luminary Honoree representing the top Hispanic professionals in engineering, technology and the science arenas.

So in conclusion I'd like to say that our hard work is paying off, but we still have a lot of hard work left to do. Operational performance is improving every day. The personnel are doing well. And we're making real progress towards a future modern force. While the demand that the new maritime strategy will place on the Submarine Force is great, we have a plan to answer the call. We're incorporating the latest technologies to make our ships more affordable and more capable at the same time. More importantly, we're continuing to invest in the thing that has made the Submarine Force the greatest in the world for decades, our people.

Please forgive my absence today, and thank you for allowing me to speak to you virtually from my office at Submarine headquarters here in Norfolk. I look forward to joining you tomorrow, and I'll be happy to address any questions that you might have during that round table session.

Thank you very much.■

NAVAL SUBMARINE LEAGUE BANQUET REMARKS BY RADM MAURICE H. RINDSKOPF, USN(Ret.) 1 NOVEMBER 2007

Submariners, spouses and honored guests: This is the third opportunity I have had to speak to this prestigious organization. The first was at the anniversary symposium in 2000 where I succeeded in covering 100 years of submarine history in 30 minutes. The second was in 2004 when I spoke at the banquet which honored submarine families; and at that event, Sylvia was singled out as the *World War II Family Representative*—or perhaps grandmother to the Force.

But tonight I am humbled to stand before you as we honor eight men who performed above and beyond the thousands of submariners all of whom can be proud of their records in war and peace.

I was six years old in 1923 when torpedoman second class Henry Breault was a crew member in 0-5 which was involved in a fatal collision at the Atlantic end of the Panama Canal with the merchantman ABANGAREZ. In utter disregard for his own life, he re-entered the sinking 0-5 closing the torpedo room hatch to save a shipmate. By the time heroic efforts of Panama Canal diver Shep Shreaves and the heavy lift crane AJAX, Henry Breault and Chief Electricians Mate Lawrence Brown were most fortunate to be rescued after 31 hours. For his selfless act of compassion and devotion to duty, he was awarded the medal of honor.

In World War II, seven submarine officers were awarded the Congressional Medal of Honor with citations opening with these words: "For conspicuous gallantry and intrepidity at the risk of their lives above and beyond the call of duty as Commanding Officer...". The first of these awards went to Commander Howard W. Gilmore in GROWLER for action in January 1943; the last to Commander George L. Street in TIRANTE in April 1945.

I was on patrol in DRUM, concurrently with those seven brave men from April 1942 until November 1944. I know what it was like to challenge and outwit the enemy in an infinite variety of condi-

tions—submerged and surfaced. We were amongst the 465 skippers who made over 1600 war patrols. That group that now numbers approximately twenty—almost all nonagenarians.

A submarine on war patrol had some 75 men and perhaps eight officers who knew that every man depended upon every man to fight the submarine without error, to sink enemy ships, and to bring it home safely. The Gato class submarine, designed by good fortune to possess long legs, high surface speed, ten torpedo tubes, and 24 torpedoes was the ideal weapons system for the anti-surface ship warfare we waged against the Japanese.

But few realize that subsystems which can be counted on one hand were the primary instruments which made these submarines so lethal in scenarios which were connected with the award of medals of honor. Let me talk a bit about these vital elements. Foremost was the torpedo data computer (TDC), an analog mechanical instrument designed to fit into the port after corner of the conning tower, and the only computer on board. One of its two sections enabled the operator to display the relative positions of own ship and target—out to a range of 8,000 yards. The young operators, some of whom became famous before the war was over, knew that each revolution of the range crank was 200 yards, and of the bearing crank, two degrees. The other section utilized the relationship so established to calculate and send to the torpedo rooms the torpedo gyro angles required to produce hits. Thus, the operator had the flexibility to aim at multiple ships in quick succession without the need for the submarine to maneuver for each and every shot.

The other key elements were the SJ surface search radar with its plan position indicator (PPI) which showed range and bearing, and the tactical formations of enemy ships. Installed almost as an afterthought was the bridge-mounted target bearing transmitter (TBT) which enabled a topside member of the fire control party to track targets visually and transmit bearings to the TDC. The periscopes and sonar are the fourth and fifth subsystems, these of course, were of primary value on submerged attacks.

Permit me then, to flesh out the award citations with brief details of what transpired. Four of the awards can be grouped together.

In July 1944, Commander Lawson P. Ramage took PARCHE on the surface into a maelstrom of merchant ships with numerous

escorts. He fired bow and stern tubes at several targets, while maneuvering violently to avoid collision. Red Ramage remained on the bridge in the face of wild gunfire as his fire control team fed data from the TBT into the TDC in the conning tower. PARCHE sank four ships and damaged three due in great measure to the flexibility provided by these key susbsystems.

In October 1944, Commander Richard H. O'Kane in TANG, already famous because he was Commander Dudley W. (Mush) Morton's Executive Officer and key member of WAHOO's brilliant fire control party, used the same effective subsystems, made surface attacks against several Japanese convoys over a two-day period, sinking five ships. The last of TANG's 24 torpedoes, fired to polish off a damaged straggler, made an erracit circular run and smashed into TANG' stern sinking her instantly with the loss of all but nine. Four of these, including Commander O'Kane, had been on the bridge or in the conning tower, the other five were amongst 13 men who escaped using the momsen lung from a depth of 180 feet. These courageous men were able to swim through the night and were picked up by Japanese patrol craft. They suffered over a year of torture in Japanese prison camps. (It is of interest that I was in DRUM, within a few miles of TANG on these very nights, and sank three ships and damaged another four).

In January 1945, Commander Eugene B. Fluckey in BARB ended a month of 'No-target frustration' as a member of a wolfpack, by boldly approaching the Chinese coast through miles of shallow water and probable mined areas to penetrate Namkwan harbor. Again using the 'attack tools' described, he succeeded in firing all his remaining torpedoes—bow and stern—destroying several of a very large group of ships at anchor. The ensuing mayhem enabled BARB to re-trace her track to deep water without damage. (I was on patrol in DRUM in Luzon straits and the East China sea during BARB's earlier patrols which resulted in the award of four navy crosses to Gene Fluckey. In 1966, Gene Fluckey and I were the last general line officers to serve together as director and deputy director of Naval Intelligence).

In April 1945, Commander George L. Street in TIRANTE penetrated the anchorage behind Quelpart Island in South Korea to destroy an ammunition ship in a blizzard of fireworks, and subse-

quently sink two escorts before returning to deep water and safety in the face of continuing enemy defensive operations. In this attack, it was TIRANTE's Executive Officer, LCDR Ned Beach, who manned the bridge with the Commanding Officer in the conning tower. The usual *tools* did their part in these attacks, but intelligence obtained from breaking of Japanese operational traffic under the codeword ULTRA provided the initial target identification and location which enabled Commander Street and TIRANTE to achieve true greatness.

The other medals of honor were awarded in three diverse situations:

In January 1943, Commander Howard W. Gilmore took GROWLER into battle submerged sinking one ship and damaging another while enduring severe depth charging. But it was some nights later near Truk Atoll, that GROWLER was engaged in a struggle with an enemy gunboat intent upon ramming. Howard Gilmore, on the bridge, reversed roles and rammed the enemy at 17 knots, sinking the ship but not before a fusillade of bullets raked GROWLER's bridge mortally wounding Howard Gilmore. His famous order "*take her down*" sacrificed his life as it saved the ship. The damaged GROWLER returned to Brisbane under command of the Executive Officer LCDR Arnold Schade where it received a new bow in the Brisbane drydock, (I saw the famous painting of a Kangaroo bounding over the bow planes when DRUM was alongside GROWLER in June 1943).

Harder, under her indomitable Commander Samuel D. Dealey, during four patrols had become a scourge to Japanese escorts and patrol craft. He employed the dangerous *down-the-throat* shot at minimal range to sink seven Japanese anti-submarine vessels. So it was ironic that on HARDER's fifth war patrol, she would attack a mine sweeper this time on the surface—using the tools of which we have talked. After firing, she dove but was overwhelmed by a string of depth charges, and failed to survive.

Finally, Captain John P. Cromwell, in SCULPIN as a potential wolfpack Commander in operations near Truk Atoll, was witness to a withering gunfire barrage when the submarine surfaced inadvertently. It killed the Commanding Officer, the Executive Officer and the third officer. Although the acting Commanding Officer took SCULPIN down, severe depth charging damaged the submarine to

the extent that fighting it out on the surface and scuttling was the only option. Half the crew became prisoners of war, Captain Cromwell, possessed of critical strategic information and knowledge of Japanese code breaking, disseminated under the code word ULTRA (as mentioned in the TIRANTE story) chose to ride the ship to the bottom, as did the acting Commanding Officer. It is not surprising to note that the official citation, issued prior to the end of the war, did not mention the critical intelligence aspects of his knowledge.

Seven World War II Medals of Honor! Four were awarded for surface actions in which skillful and aggressive skippers overwhelmed the enemy's defenses. Three were awarded posthumously under diverse circumstances—one for consistent aggressiveness in close quarters with an onrushing enemy; one in a hail of gunfire following a collision which no doubt saved the submarine to fight another day; and finally, one to an officer who sacrificed his life because he was possessed of too many vital secrets.

To all of these brave officers, and to the enlisted man who risked his life to save a shipmate, the members of the Naval Submarine league do honor here tonight. May their deeds be forever remembered!■

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FEATURED SPEAKERS:

Gen James T. Conway, USMC, Commandant of the Marine Corps (confirmed)
ADM Timothy J. Keating, USN, Commander, U.S. Pacific Command (confirmed)
SgtMaj Carlton W. Kent, USMC, Sergeant Major of the Marine Corps (invited)
Mr. John M. McDuffie, Vice President, U.S. Public Sector, Microsoft Corporation (confir
ADM Gary Roughead, USN, Chief of Naval Operations (invited)
The Honorable Arnold Schwarzenegger, Governor of California (invited)
The Honorable Donald C. Winter, Secretary of the Navy (invited)

SUBMARINE DECKPLATE LEADERSHIP

by FORCM(SS) Jeffrey D. Garrison, USN

Master Chief Garrison is the Force Master Chief for the Atlantic Fleet Submarine Force.

Introduction

Admiral Mies, and Naval Submarine League, thanks for giving me the opportunity to address you today. I regret that the Pacific Force Master Chief Mo Pollard could not attend, as he had other commitments but he wanted me to pass along his best.

This is my first time speaking as the Submarine Force Master Chief and I can think of no better group to address early in my tenure than the members of the Naval Submarine League. I have been given a 30 minute time slot this afternoon, however, my prepared remarks will not use the allotted time so I am looking forward to some questions from you.

It is appropriate that I am here to talk with you in October, the bloodiest month for the Submarine Force during WWII. Of our 52 Submarines lost from 1941 through 1945, 8 total were lost during the Octobers of 1943 and 1944. One of these was USS WAHOO (SS-238), whose feats have become submarine legend. She sank 27 ships totaling over 119,000 tons before her loss on 11 October 1943.

These 52 great crews and the other submarine crews of WWII have left us a rich history with innumerable inspirational examples of what we can be.

As you heard this morning from our Force Commander, our Submarine Force is placing emphasis on 3 priorities; Operational Excellence, Development of our People and Maintenance and Moderation of our Force.

My focus is and will always be centered around the Personal and Professional Development of our Sailors we are entrusted to lead everyday. Providing a tie to this rich history is not only part of my responsibility, but is also part of my strategy to accomplishing this important priority.

A goal of mine is to instill in our Sailors today, a respect for this rich history. A few examples of what we are doing:

On most boats when a Sailor is awarded his dolphins, a selected passage from books on submarine history, such as Thunder Below and Clear the Bridge, is read. This works to keep the crew grounded, gives qualified Sailors a sense of being a part of history, and helps the crew stay focused on what is important. 16 June 1987, was the proudest day of my career. After punching through the ice on USS PINTADO, I received my dolphins with four other Shipmates at the North Pole.

This past May, USS LOS ANGELES deployed with a cribbage board that belonged to Medal of Honor recipient and WWII prisoner of war Rear Admiral Richard H. O'Kane. The tradition of passing the cribbage board from the oldest submarine to the next was started with the second submarine named USS TANG (SS-563) and was most recently passed to USS LOS ANGELES from USS PARCHE. As said by USS LOS ANGELES Commanding Officer Erik Burian, "Embarking with a piece of submarine history is a constant reminder of the legacy that we will continue."

I had the distinct honor of meeting Signalman 2nd class Neal Sever earlier this year. Some of you might remember Neal as part of the only ground combat operation on the Japanese Mainland in WWII. Under command of Eugene Fluckey during that famous 12th war patrol of USS BARB, Neal and 7 other men went ashore to blow up that train. As he told this story to the crew of USS OKLAHOMA CITY, I could see the tremendous amount of pride and professionalism displayed on every crew member's face. As I visit our boats in port or at sea, I will continue to impress upon our Sailors the importance of pride and professionalism in all we do.

Another key piece of my strategy is to continue the recent emphasis on *Deck-plate Leadership*.

- Mission, Vision and Guiding Principles.
- Deck-plate Leadership: "Chiefs are visible leaders who set the tone. We will know the mission, know our Sailors, and develop them beyond their expectations as a team and as individuals". We have revitalized this in our Submarine Force and it is paying off.
- Delivery of USS HAWAII two months early and with flying colors. This difficult task was attributed to the

leadership within the Chiefs Quarters led by Master Chief Bob Bentley, his *Deckplate Leadership* was recognized by CNO Admiral Mike Mullen during his ride.

- After a successful 6 month deployment, USS ALEXANDRIA was able to deploy again a short 3 months later and completed ICEX 2007. This joint tactical exercise off the northern coast of Alaska would not have been successful without the hard work of the crew under the leadership of the Chief Petty Officers.
- 75 percent reduction in traffic fatalities from FY06
- NAVSAFCEN TRiPS (Travel Risk Planning System)
- Emphasis placed on motorcycle safety. Overall 29 percent decrease Navy wide on motorcycle fatalities this year. None in the Submarine Force.
- 23 percent reduction in illegal drug use.
- Urinalysis compliance is up. Randomly testing a minimum of 4 times a month with at least 15 percent of the crew.
- DUI's down 3.5 percent from last year. More importantly, there was a 6.5 percent decrease from our Sailors on sea duty. As the Admiral mentioned this morning, 13 crews have gone more than a year without a DUI with USS ALEXANDRIA going on 3 years.
- Safe ride programs are strong. Since inception in Groton 11 months ago over 215 Sailors have used this program.
- Subscol report card system – Allows the leadership on the boat to identify High Risk Sailors early.
- We are educating our Sailors to ensure they develop a *Culture of Financial Fitness*. Identity theft and predatory lending are two immediate concerns. Payday loans still affect 1 in 5 military families. We continue to push the Navy's thrift savings plan as this is a great tool that starts a young Sailor and his family off on the right foot.

Education

Earlier this year we rescinded the requirement for enlisted personnel to achieve a degree prior to selection to Senior Chief or Master Chief. Although we value and encourage education, our senior enlisted community is focused on developing our Sailors not

through books, but through *Deckplate Leadership*. Having said that, we continue to educate our Senior Enlisted Leadership at the Senior Enlisted Academy in Newport, R.I. This 6 week resident course focuses on many subjects and situations that our front line leaders will encounter at the LCPO level. Additionally, prior to assignment as a Chief of the Boat, Senior Chiefs and Master Chiefs are required to attend a 2 week COB/CMC course taught in Newport, R.I.

Engineering Department Master Chief or EDMC Working Conferences and Courses

This initiative was prompted by Naval Reactors in early 2006 after we suffered numerous uplanned losses by serving Engineering Department Master Chief's. These conferences occur every 6 months and are attended by all available EDMC's. The group to date has been responsible for numerous Sailor work load reduction initiatives removing unnecessary administrative practices, establishment of the EDMC Forum Website, and EDMC course development. The first EDMC course was completed in August and is taught once a month in Norfolk by our Force EDMC. This course improves the skill sets of our best nuclear-trained Chief Petty Officers as they prepare to serve in one of our most challenging billets. We are also in the final stages of the development of a Nuclear Leading Chief Petty Officer Course. This two week course was initiated to help mitigate the reduced experience of nuclear LCPOS; which in the last 10 years has dropped from 14 years to 11 years and in some cases only 8 years. The course will commence in April 2008 with a goal to provide these leaders with additional tools to ensure their success in their first LCPO sea tour. Investment now in these critical areas will ensure success for our future.

Retention

The Submarine Force prides itself with on ability to retain properly trained, diverse and top performing personnel. The leadership applied over this past year in our war for talent has clearly made a difference. We have arrested the downward trend in retention we have seen over the past 3 years and have seen a steady increase in all zones since February. We are above the CNO benchmark in

Zones A and B and right at the benchmark for Zone C and it continues to look promising.

Retention Deep Dives

Next week we will place a team of experts on one of our retention challenged boats. The goal is to determine the root cause of poor retention, high attrition and low morale. The team's mission is not to provide the Commanding Officer with a list of deficiencies but rather issues that the command can focus on to improve retention and morale. Future Deep Dive visits will include commands with high retention and low attrition to identify and understand successful practices that can be shared with the rest of the Force.

Reenlistment Bonuses for some nuclear ratings are at the highest levels ever. All nuclear ratings increased to a maximum ceiling of $90,000. The latest SRB message earlier this month reflects all submarine ratings either increasing or remaining the same award level with the exception of 1.

USS LA JOLLA has re-enlisted 16 personnel in the last 3 months and is heading for the retention honor roll.

Attrition

Each year our Force loses talented personnel. Some of these Sailors have the training, knowledge and capabilities that make them a valued member of our team. Command involvement is the key to prevent our young Sailors from making career ending actions or decisions. There is no greater impact on these Sailors than our Chief Petty Officers. Just over 20 percent of our Attrition comes from a combination of our Physical Fitness Assessment program and Misconduct.

These are the 2 areas where I feel *Deckplate Leadership* have the biggest impact: First:

Physical Fitness and Health

As you're aware the submarine life is not always conducive to a healthy lifestyle. We still have the best food in the Navy and unfortunately sometimes it shows. We are working hard on developing installed treadmills that will fit directly into the deck of our boats. Additionally, we recently placed 2 nutritionists onboard USS

MONTPELIER for a short underway to help better understand the lifestyle of a Submarine Sailor. Navy menus fleet wide have been standardized to afford our Sailors healthier choices. We have seen a dramatic decrease in 3 time failures from our semi-annual PFA's. 475 failures in the Spring of 06 to 145 in the Spring of 07. Our physical fitness program has teeth and its paying off.

Misconduct

We have enjoyed a 58 percent decrease in attrition resulting from misconduct from FY 06 to FY 07 in all Zones. Our Chief Petty Officers are working hard at instilling pride and professionalism in our young Sailors during that critical first 30 days onboard and throughout their first tour. Professional Development Boards and solid command sponsorship programs are just a few tools at the disposal of the Chief Petty Officers.

Chief's Standards and Conduct Board

This new program is currently being piloted at our Submarine School. This program is designed to allow the Chiefs' Mess greater involvement in handling minor behavioral infractions, identifying potentially high risk Sailors, and intervening early to prevent future, and potentially more serious, misconduct. Chief's Standards and Conduct Board is an administrative action forum and is not punitive in nature. The board will use traditional administrative remedies, such as corrective counseling and extra military instruction. Additionally, the Chief's Standards and Conduct Board can offer a Sailor voluntary diversion when he or she recognizes their infractions and, as an alternative to Non Judicial Punishment or NJP, freely place themselves on restriction for a period of no more than 14 days. The board is meant to be a flexible process. It can be used either independently or as part of the formal disciplinary process.

Individual Augmentees (IA's)

We are not only fighting the Global War on Terror from our Submarines at Sea, but we are playing a vital role with our Sailors on the ground in places like Iraq, Afghanistan, Djibouti, Kuwait, and other hot spots around the globe. Preparation for our Sailors and their families is priority. Admiral Mullen said it best "Personal and

Family Readiness equates to Combat Readiness." Maintaining continuous contact with our Sailors and their families throughout deployment is critical to this successful mission.

- We currently have 122 Sailors with boots on ground
- Total of 390 since 2005.
- Currently 4 Submarine Command Master Chiefs with Boots on Ground.

Conclusion

Our hard work is paying off. Our Sailors are doing well, and it is our Chief Petty Officers that are leading the charge. As we continue to leverage on the advances in technology, I assure you that we remain vigilant on our number one resource that has been the single most important factor in the history of our great Submarine Force: Our Sailors.

Thank you for the opportunity you given me today and the support you give to our Sailors and their families.■

ARTICLES

LCS: A DANGER SIGNAL FOR SHIPBUILDING

by RADM William J. Holland, Jr. USN (Ret)

Rear Admiral Holland is a retired submarine officer. He has been a frequent contributor to THE SUBMARINE REVIEW since its founding.

In his remarks to the Washington Chapter of the Naval Submarine League November 9, the Royal Navy's attaché, Captain Steve Ramm described the trials and tribulations associated with the design and construction of the Royal Navy's next attack submarine, HMS ASTUTE. She is to be the first of a class of seven ships with initial sea trials set for next spring. ASTUTE is rated at a design speed of 25 knots, with six tubes and a crew of 109 (89 on board). She will be delivered at least three years late costing 30% more than originally predicted. While this sad result stands in stark contrast to the US submarine builders who are lowering their costs and shortening the construction time of the Virginia follow ships, the recent debacle of the Littoral Combat Ship (LCS) suggests that the causes of ASTUTE's difficulties are not unique to Great Britain. Understanding them is a key to avoid sliding into the pit demonstrated by the LCS acquisition debacle.

The cause of all causes in Great Britain is the overwhelming emphasis concentrating on budget management and financial controls in the Ministry of Defense. This political centralization stemmed from the Procurement Philosophy in the 1990's. The British version of this philosophy sounds chillingly like the actions of the American defense hierarchy starting in the mid-eighties. This theory holds that *Everything is better managed by Industry than Government*, so therefore government expertise can be radically pruned. However because the Cold War was over, orders for new equipment were not forthcoming. So industry not only did not replace the capability to design and build that formerly resided in the

government, but allowed their own capability to atrophy. Then in this desert of technical expertise, ASTUTE's "...Prime Contract was with a single entity that had never before built a submarine and to a function and performance specification."

The concern with unit cost crippled timely construction of the lead ship—probably because the managers of the budget were ignorant about the design process and failed to comprehend the complicated processes related to building anything more than their backyard patio. The result would have been the same if the mandarins were managing wood products for the mobile home industry except in that case they probably would no longer have a job. Like it or not, orders of few numbers result in expensive products. "In terms of cost, even if the risks are managed successfully, our overheads are being spread amongst fewer and fewer assets meaning that unit costs will inexorably rise."

The second difficulty arose from the fifteen-year gap between the TRAFALGAR and the ASTUTE. The Ministry of Defense and the Royal Navy no longer had the technical competence or capacity within their organizations to determine the design specifications, recognize characteristic tradeoffs or supervise construction. For ASTUTE, those factors were turned over to the contractor—a single company which had never built a submarine. The terms in Captain Ramm's shorthand were "Give us a submarine in seven years and let us know when it's finished." Like LCS, ASTUTE went into production before there was a mature design or a competent shipbuilder.

This all sounds too familiar to American Navy surface warriors who continue to grope for a new warship design while saddled with many of these same burdens. While submariners can take some pride in having maneuvered around these issues in the Seawolf and Virginia classes, the pitfalls lurk in the Department of the Navy's managerial arrangements. As admonished by Admirals King, Nimitz and Rickover, if you can't point your finger at who is responsible, no one is. Today, acquisition of new warships is the responsibility of the Assistant Secretary of the Navy for Research, Development and Acquisition. Presently vacant, the last incumbent's previous post was as an EE professor at the Naval Academy. Reporting to her were eleven Deputy Assistant Secretaries of the Navy, fourteen Program

Executive Officers, and seven System Commanders. In this organizational swamp, six Deputy Assistant Secretaries, three System Commanders and seven Program Executive Officers had responsibility for some portion of the LCS or her equipment. The building yards had no prior experience with warship construction and the designs are not yet mature enough to guarantee the mission modules will fit in the ships.

In this morass, *Team Submarine* stands out as a mechanism working around these barriers by co-opting the necessary portions of various organizations under a single head. The submarine and their supporting organizations are long time customers of shipbuilders managed by experienced shipbuilders who have been building submarines for decades. The shipbuilders know those officials responsible for all aspects of the design and construction. The on-sight supervision by the Supervisor of Shipbuilding ensures that differences between the government and the yard can be adjudicated in reasonable time and mistakes can be remedied quickly.

Captain Ramm's prescriptions for a successful shipbuilding program are ones that American submariners will recognize.

"Continuity in design is very important." Design work must continue even if there is no immediate construction portending.

"Industry needs an intelligent customer." Designs must be mature (that doesn't mean complete) before construction starts. The exact specifications for the ship must be evident and agreed to by the shipbuilder and the government. When ships come in ones and twos, the system cannot function like a commercial business. Neither the government nor the shipbuilder can wait for customers to indicate what sort of grill on the car sells best.

"Design authority must be maintained in the Ministry of Defense." This requires officers and civilian personnel who are competent in naval architecture, in the physics of the ocean, in details of engineering plants, sensors, weapons and communications. Skilled designers and technical people must be maintained. If they are not, a generation will be required to restore that competency.

"Shipbuilders, not systems integrators, must be in charge of building the ship."

Captain Ramm has done us great service—enunciating what most persons associated with submarine design and construction, civilian

and military, know to be true. Attempts in the past to avoid the hard issues of developing a new ship's requirements, of trading off aspects of the desired development including cost, and of developing detailed and exacting specifications for construction and outfitting have all resulted in poorly performing ships built at costs greater than anticipated. Further, the lack of design engineering talent in the government has resulted in inadequate support for the ships after construction. All of these faults add up to poorly designed ships with short lifetimes. US submarines have largely escaped that fate because of a refusal to compromise standards, a recent history of fairly accurate cost estimates, and the steady hand of the Directors of Naval Nuclear Propulsion who have made sure their power plants are not attached to scows.

The organization of the Department of Navy as it exists today now has a reputation for cost over-runs, late delivery, long post shakedown availabilities to bring new ships into serviceable condition, and for many ships, short service lives. Reorganization in a manner to return a degree of confidence in the capability to build surface warships is unlikely. Outside the Submarine Force, the Arleigh Burke class continues to be well constructed, costing reasonably close to the estimated price and performing well after commissioning. Returning to the organization that existed when that ship was developed, designed and built would be a good start to solving the present problems in shipbuilding but requires decisive actions beyond the capability of the administration. As to the next class of small surface warships, seven to ten years have been lost while various officials labored in hope and hype rather than in analysis and technical details.■

GLOBAL PARTNERSHIPS, THE SUBMARINE FORCE, AND NAVAL INTERNATIONAL PROGRAMS

by Captain Sam J. Tangredi, USN

Editor's Note: CAPT Sam Tangredi's last article for THE SUBMARINE REVIEW, a brief operational history of the Hellenic (Greek) Navy Submarine Force, was republished (in Greek) in the Hellenic Navy's official history journal Naftiki Epitheorisi (Naval Review) and the Hellenic Strategic Studies Institute's Provlimatismi (Issues). After a brief tour as Defense and Naval Attache to Greece, he established the new Strategic Planning and Business Development Directorate of the Navy International Programs Office.

According to Homer, Helen of Troy had "the face that launched a thousand ships" in that legendary war. But in Greek myths it was a little-known god, Hephaestos (pronounced Hee-fes-tes)—the Mount Olympus weapons-smith—who inspired the ships' construction.

Within the Department of the Navy, it is a little-known office—the Navy International Programs Office (NIPO)—that plays the role of Hephaestos in enabling our allies and coalition partners to develop weapons systems and military organizations that are functionally interoperable with U.S. forces. For years it has been charged with development and oversight of foreign military sales, international cooperative agreements, excess defense article transfers (such as decommissioned ships and aircraft), technology transfer and licensing, personnel exchanges, and international military education and training—which are collectively known as naval international programs—for the Navy, Marine Corps and Coast Guard team.

NIPO may be particularly little known among submariners, despite the fact that it has been Strategic Systems Programs' closest neighbor at both Nebraska Avenue and, now, Crystal City. That is because, unlike platforms for other naval communities, we do not build (or provide) whole submarines for partner nations. But we once did. And if Taiwan gets its wish, we might again.

What we do provide, however, are submarine combat systems, fire control suites, sonar sensors, communications antenna, torpedoes, cruise missiles, and other weapons and equipment for foreign submarines, in recent years most notably the UK and Australia. But practically every other Submarine Force has some U.S. originated gear. For example, when accepting the first Type 214 submarines from Howaldtwerke Deutsche Werft (HDW), the Greek Navy insisted on the capability of firing sub-launched Harpoon out of the torpedo tubes; indeed, Harpoon is considered a highly desirable weapon for navies that operate Type 209s/214s.

The purpose of this article is to acquaint the submarine community with NIPO and familiarize you with what we are calling *the quiet revolution* in naval international programs.

"It's About Relationships."

When as CNO, Admiral Mike Mullen launched the concept of a *Thousand Ship Navy* (TSN), he turned to NIPO—as the Department of the Navy's Hephaestos—to help implement the material and training aspects of relationship building with long-term allies *and* non-traditional partners. Since the Title 10 responsibilities of the Navy are *train and equip*, NIPO focused not on developing its own plan, but on implementing the naval (and C4I and, frequently, territorial air defense) objectives of the Theater Security Cooperation Plans (TSCPs) of the regional Combatant Commanders (COCOMs). This was done by developing a new strategic planning *methodology* (rather than separate plan) that prioritized the finite resources of the Department of the Navy in terms of COCOM requirements to help equip and train foreign militaries, or to *build partner capacity*. The method is also focused on expanding the maritime interoperability necessary for maritime cooperation with all nations, which is a major element of the *Cooperative Strategy for 21st Century Seapower* unveiled by new CNO Admiral Gary Roughead.

The key word is partnership. While foreign sales of weapons systems or technical support may benefit U.S. industry, and in some cases provide cost savings or cost avoidance to the Department of the Navy, of even greater importance is the level of increasing

interoperability and familiarity such sales or grants bring to combined operations. As Secretary of the Navy Donald Winter stated in his directions to NIPO: "It's not about selling stuff...it's about relationships."

What are Naval International Programs?

Naval international programs provide direct defense support to treaty allies and other partners, usually through material transfer or sale of weapons systems or support services, or the classroom training of foreign personnel. This is most visible in the category of security assistance, such as Department of the Navy (DoN) support and management of foreign acquisition programs, and is not exclusive to foreign navies or marine corps. In fact, air forces of such countries as Switzerland, Finland, and Canada operate U.S. naval aircraft as their main air defense weapons.

For such nations to acquire advanced-technology American weapons systems—systems for which the U.S. Congress and the Secretary of Defense have mandated stringent, elaborate, and lengthy vetting and transfer procedures—requires an organization dedicated to overcoming the statutory, regulatory and logistical hurdles, as well as to the planning, negotiating, and industrial relations necessary to success. Recent agreements with the United Kingdom and Australia to reduce some of the International Trade in Armaments (ITAR) restrictions are a significant improvement for the two nations with which we have the strongest cooperation in submarine-related programs. However, the overall technology transfer process usually runs for over six months, or even years. Identifying the barriers to the internationalization of DoN acquisition programs is a significant step in the new strategic planning methodology effort to highlight potential roadblocks and thereby streamlining the process.

Over two decades ago, NIPO was organized from a number of related offices scattered throughout DoN to provide unity in a single management structure for:

- Foreign military sales (FMS)
- Foreign military financing (FMF)
- Excess defense article (EDA) transfers

- Cooperative agreements
- Establishing DoN policy concerning the transfer of technology/technology security and participating in the DoD technology transfer process
- License reviews for direct commercial sales (DCS) of naval systems
- Defense personnel exchanges
- Training of foreign military personnel including the International Military Education and Training (IMET) program
- Management of naval Section 1206 programs

Foreign military sales (FMS) are sales of U.S. systems to a foreign government with the acquisition managed by the U.S. government as if it were a U.S. defense acquisition program. Recent FMS cases have included periscopes, submarine antennae, MK48 torpedoes, BYG-1 combat systems, and test gear. Some of the nations involved include: Australia, Brazil, Canada, Italy, Singapore and the UK. Foreign military financing (FMF) is the same except that the purchase is financed by U.S. dollars as foreign aid. Generally this is not used to purchase submarine equipment, although a potential exception is Egypt.

Excess defense article (EDA) transfers provide other nations with good condition U.S. equipment that is being retired from inventory. Today this consists of surface ships and aircraft, but prior to the 1990s this also included transfer of much of the remaining inventory of diesel submarines. Treated almost as capital ships, they were operated and maintained by the recipients until parts and expertise were exhausted. As an example, USS REMORA (SS-487)/Hellenic Submarine KATSONIS (S-115) was finally decommissioned by Greece in 1993, giving it reasonable claim to the title of submarine with the longest commissioned service. Whatever these transfers contributed to maritime security, they built relationships with the submarine community of many smaller navies, relationships that may have weakened with HDW ruling the diesel submarine market.

Cooperative agreements are negotiated multi-national acquisition programs for such naval systems as Rolling Airframe Missile (RAM). They, like FMS, FMF, and EDA, are guided by a strict

Defense Department technology transfer procedure, for which NIPO is the Department of the Navy's executive agent. If a foreign nation decides to buy a U.S. built or designed weapons system directly from the manufacturer without using the FMS system, NIPO still becomes involved in this direct commercial sale (DCS) by participating in the licensing and approval from DoD, the State Department and Congress. Many submarine parts and components are purchased from U.S. industry via DCS. NIPO also facilitates Navy Department approval of many scientific, acquisition, and training personnel exchanges, including for submarine personnel.

NIPO also plays a significant role in international training, particularly in the State Department-supervised and COCOM-managed International Military Education and Training (IMET) program. U.S. training—including submarine-related training—can also be purchased via the FMS system. This training portfolio is managed by the Naval Education and Training Security Assistance Field Activity (NETSAFA) in Pensacola, Florida, primarily funded through NIPO.

The latest series of programs managed by NIPO is directed at providing other nations—particularly non-traditional partners—assistance for the global war on terror (GWOT). Known as 1206 programs since they derive from Section 1206 of the FY 2006 Defense Authorization Act, these are COCOM-initiated programs funded from the U.S. Defense Budget to provide such capabilities as maritime domain awareness (coastal radars) to nations such as Sao Tome or Sri Lanka. It is doubtful these funds would be used for submarine programs, but they could be used for purchasing underwater sensors for port security.

Assistance *and* Security

In what turned out to be inspired genius, NIPO was designed to incorporate those personnel charged with the development and success of naval security assistance programs *with* those personnel entrusted with the security of U.S. naval technology and technical information, and with restricting (or facilitating, as appropriate) transfer or access to critical technologies that the U.S. may wish to retain for itself. By having the security assistance and the technology transfer personnel working side-by-side, NIPO has developed

synergy and unity of effort that has often eluded the overall DoD process, a process both the Secretaries of Defense and State want to improve.

But whether or not NIPO's organization is a key to success in building international relationships, it is important to recognize its limitations. Naval international programs constitute only a portion of the Department of the Navy's overall security cooperation efforts, with such security cooperation tools as combined training, port visits, and military–to–military talks remaining in the hands of the COCOMs, or OPNAV or HQMC. This recognition contributed to the decision to build a strategic planning method that tied international programs to the COCOM theater security cooperation plans, along with USN, USMC, and USCG guidance.

Method of the Methodology

The strategic planning method NIPO has adopted is designed to be straightforward and transparent. Primary step is the analysis of all applicable security cooperation guidance from DoD and DoN leadership, with the dominant source being the regional COCOMs' Theater Security Cooperation Plans (TSCP). Using content analysis techniques, the Theater Cooperation Plans are—on a regional basis—turned into numerical matrices representing countries (potential partners) versus desired naval capabilities (naval warfare areas). Level of priority is indicated on a 5 (highest), 3 (middle), 1 (low), and 0 (none) scale. The objective is to accurately define the COCOM's priorities on a country by country *and* on a warfare area by warfare comparison. This is a capabilities-based analysis derived from COCOM requirements. The resulting matrices are returned to the COCOM (and naval component commander, as appropriate) for approval.

NIPO then looks at current or future naval and joint acquisition programs, as well as anticipated EDA or commercial offerings, in order to determine which program could best fill the COCOM's particular capability requirement for that country. There may be a number of options, including training programs. For example, if a COCOM wants to help increase a country's counter-terror capability, it must be determined whether the best approach is with platforms, weapons, C4I or training, as well as what the

Navy–Marine Corps–Coast Guard team is positioned to provide. Once the optimal program is identified to support the capability requirements, NIPO works with SYSCOMs, program offices, training communities, and industry (or other providers) to determine the probability of a successful program.

Potential programs are then ranked by using the security cooperation/COCOM priority multiplied by the probability of success. Then a detailed assessment of the regulatory and political barriers is made. Given finite resources, this decision-aid tool allows NIPO to work in consultation with the COCOMs and Naval and Marine Component Commanders to determine where NIPO should put its effort in developing new security cooperation opportunities. The top level results of this iterative analytical process is briefed or submitted to the COCOMs and the naval leadership on a weekly basis.

Because it is an iterative method, directly adaptable to the changes in COCOM planning, we continue to constantly make improvements to ensure requirements of all elements of the Department of the Navy, and other Defense and State Department organizations are included.

Acquisition Program Values

NIPO is actually in the acquisition, not the policy, chain–of–command. The Deputy Assistant Secretary of the Navy (International Programs), who is the Director of NIPO, reports to the Assistant Secretary of the Navy (Research, Development and Acquisition), although he also is *dual hated* to OPNAV and HQMC for policy matters. He also acts as the Coast Guard's agent for security assistance programs by memorandum of agreement (MOA).

Being in the acquisition chain makes us conscious of our potential contributions to provide economies of scale to ongoing USN, USMC and USCG programs via international sales. Yet, under the principle of *it's about relationships*, this is *not* the driving factor of our calculus. This ensures low dollar value programs with non-traditional partners receive the same attention as higher value programs, as based on COCOM requirements.

However, there are times when it is appropriate to try to maximize the opportunity for cost savings or cost avoidance for programs such as F/A-18E/F, AEGIS, Harpoon, and, potentially, Littoral

Combat Ship. These benefits can be elusive, however. The savings are largely determined by our contract with the manufacturer, which must be structured to lower costs to the government in the event of international sales. The F/A-18 program has enjoyed valid savings because of exactly this type of contracting, but other programs are not always so structured. If a program can validate the possibility of major savings, that could be an addition planning factor, subordinate to the imperative for relationship-building as per the COCOM plans.

Real World Programs

When other nations utilize U.S. defense systems, it is a profound statement about their security relationships. It recognizes more than the source of reliable, maintainable technology; it identifies a commonality of strategic purpose—a partnership, if you will. This commonality of purpose is at the heart of the 1000 Ship Navy concept. It also is the greatest facilitator of bilateral and multilateral interoperability.

In regions suffering from instability, international programs—most likely security assistance under the FMF or 1206 programs or IMET—can be considered part of the joint multilateral coalition *phase zero* campaign. We are attempting to ensure that endangered countries have access to the tools by which they can defend themselves. We are also trying to reach those countries that have only recently recognized the value of security cooperation with the United States—what we have been calling non-traditional partners.

This includes nations that have traditionally sought security cooperation elsewhere. Immediately after President Bush's visit to India and his call for a strategic partnership, NIPO was in communications with the Indian Navy and Air Force concerning ways we could cooperate. This was in close coordination with CNO Admiral Mullen, Admiral Fallon as Commander, Pacific Command, and Admiral Roughead as Commander, Pacific Fleet. While there are a number of programs in development, the refurbishment and transfer of the ex-USS *Trenton* (LPD-14) to the India Navy as INS *Jalashwa*, now the third largest ship in the Indian Fleet, is the first real building block to an expanding defense relationship.

In Africa, Section 1206 programs like the Gulf of Guinea Regional Maritime Awareness (RMAC) initiative, originated by

Admiral Ulrich as Commander, Naval Forces Europe, have created a dialog with nations whose ungoverned water–space might become a transit lane for terrorists. Fulfilling these countries long-standing desire to be able to monitor and control their own waters provides benefit to them and improves the regional security climate.

Interoperability with traditional allies includes the integration of combat systems, achieved through the sales of combat systems such as AEGIS—integrated into Spanish, Japanese and Korean–built hulls. Since the best interoperability occurs when we all use the same systems, this provides the high end/net-centric keel for the 1000 ships vision.

While U.S. submarine technology for partner nations is integrated at the systems level or as components, there is one potential total platform program. When President G. W. Bush offered a package of defensive measures to strengthen Taiwan, his offer included the possibility of diesel submarines. Although a diesel submarine has not been built in the U.S. for over forty years, Taiwan is currently contemplating a two-phase FMS program, in which the first phase would be a feasibility and design study for a new construction submarine. Following this first phase, Taiwan could decide whether it was practicable and affordable to construct a diesel submarine in the United States.

Inspiring a New Process

The term *revolution in military affairs* (RMA) was first popularized in the 1980s to defense transformation. While the reality of the RMA has been hotly debated, it is certainly fair to describe the ongoing transformation at NIPO as starting a *quiet revolution in international programs*. This *quiet revolution* has the potential of leading DoD-wide change if its underlying philosophy of objective, transparent prioritization is adopted by the Defense Security Cooperation Agency and the other Military Departments. Of course, we do not presume to dictate the planning methods of our sister Services. But like Hephaestos, we intend to inspire through example.■

FALKLANDS MEMORIES

CDR Jonathan (Jonty) Powis, RN

Jonty Powis served in the Royal Navy from 1974 – 2006, serving in a variety of ships from offshore patrol vessels to aircraft carriers. However, it was in submarines that he found his metier. As a junior officer he served in HM Ships SOVEREIGN and SCEPTRE before specialising in Navigation and joining HMS CONQUEROR for the Falklands and other Cold War patrols. He then taught the art of navigation to a generation of submariners before going to HMS WALRUS (SSK) as XO. He passed the Perisher command exam in 1986 and went to HMS RESOLUTION as XO. He was then appointed to his first Command in the second of the Upholder class SSKs, HMS UNSEEN (now HMCS VICTORIA) as her first CO, then on promotion back to RESOLUTION as her last CO before again acting as the first CO of the Trident boat HMS VICTORIOUS. He also spent time in a number of other boats as supernumerary including the French SSN FS RUBIS. Coming ashore in Oct 1996 he served in the UK embassy in Washington DC for three years and the Ministry of Defence on his return to the UK. His last job in uniform was as the UK Submarine Rescue Officer. He is now employed by Rolls Royce (Marine) to run the NATO Rescue Service (NSRS) as a civilian.

This year marked the 25th anniversary of the strange little war in the South Atlantic over the windswept Falkland Islands (Islas Malvinas to the Argentines). Their importance was easy to overlook then but the mineral rights, fisheries and access to the Antarctic are obvious now. At the time the animosity between the two countries over the territory and the unwillingness of the UK Foreign Office to commit to the inhabitants, put the kybosh on any attempt at development. The reasons for, or the results of, the conflict are not for this piece to address. This is an attempt to reflect on what happened to me. What follows is a collection of my memories about the patrol that HMS CONQUEROR conducted as

part of the UK Task Group. The facts as I remember them are reproduced below. Some of them may be disputed but it is as I remember. The wider issues were best summarized for me by an American politico chum of my father who stated, "Both countries needed it". She was right in that the Argies got rid of an oppressive military dictatorship and the Brits rediscovered their self-confidence.

At the beginning of 1982 I was a young (26 - just) and inexperienced navigator serving in SSN HMS CONQUEROR. I was just starting to find my feet and master the several challenges of being the operations officer, pilot and watch leader. In truth I had seized the opportunity of early advancement too eagerly and I was only just starting to make myself useful to my Captain.

The mood in the UK at that time was quite different to that of today. An air of decline pervaded everything in the news. The Thatcher revolution was only just getting started and 35 years of imperial, political, military, social and financial decline and ineptitude since 1945 made people used to disappointment in international and domestic affairs. The Armed Services and particularly the Navy were facing further cuts despite being at the height of the Cold War. The RN was to lose its amphibious forces and both of its little carriers, thus to be reduced to little more than an escort force for the USN. Morale was fragile and in submarines people were looking at the Australian or Canadian Navies and the civil nuclear power program rather than staying in the service. Nevertheless efficiency was still high as we were about to demonstrate.

CONQUEROR (CONX) had been commissioned in 1971 but was un-modernized. She had the late 1950's technology bow sonar 2001 and a crude towed array but no TMA computer and no IT to speak of. Capable of 27 knots when new, the towed array robbed her of one of those. Her deep diving depth was 750' but we had to record all dives below 500', to this day I am not sure why. We were inordinately proud of our SSIXS terminal and an ancient SatNav. However, during the previous running period electrical failures meant that I found myself using the periscope sextant in earnest to find Fort Lauderdale. We were all pleasantly surprised when I did. The end of March '82 had the UK glued to its TV screens as the bizarre events in South Georgia and Port Stanley unfolded.

CONX was emerging from a short maintenance period which was made very much more enjoyable as we were told to store for war and were placed in the enviable situation of having a higher stores priority than the deploying SSBN.

We embarked so much food we had to double deck the main corridor with tins. We had a full outfit of weapons and 12 members of the SBS (Navy Special Forces) and a pile of their paraphernalia. It was regarded as intensely secret that these guys were on board. The first 9 joined in the middle of the night and were not allowed onto the casing even to exercise unless it was dark. At the last minute we were asked to embark the last 3 who drove the 500 mile length of the country in a bus and arrived in broad daylight to unload canoes, skis, guns and bombs. To confuse any Argie spies the bus parked next to the submarine was marked *Royal Marines Sky Diving Team.*

The passage south of over 8000 miles was conducted flat out; 21 days in the full power state reading one routine every 24hrs and devouring the news. The submarine must have woken every Atlantic sonar operator; she had two un-insulated turbo-driven feed pumps for the full power state, which screamed.

All the way south we were uncertain about what would transpire. Nobody believed that the politicians would hold their nerve and start a shooting war. After 35 years of the retreat from empire, we were sure that we would find ourselves going north soon, but not quite so fast. The new Captain and the XO kept us busy with drills and practice attacks. We had a whole new threat to learn as the Argie forces were a mix of US, UK, French and local platforms.

We arrived off South Georgia in support of the small surface task group based there. However a significant event the day before had sharpened us to the truth and drama of the situation. The day we raised the central 10,000 ft peak of South Georgia, during my forenoon watch we detected the classic signature of a submarine running diesel engines. The bearing rate was high enough for a snorting submarine to be close. The Captain was summoned and we rushed to periscope depth at action stations with tubes ready. Nothing was in sight so we assumed that the submarine was dived and snorting at slow speed just outside visual range. We returned to the depths to approach the firing position. As we left the layer we

lost contact and never regained it. We tried all sorts; going shallow again then deeper, active sonar, sprinting beyond supposed maximum range and looking back at the target actively and passively; all fruitless. We came shallow again to make a contact report having given up hope of regaining contact. The next day the Argie submarine SANTE FE (ex USS CATFISH SS 339) was caught on the surface by helicopters from HMS ENDURANCE and HMS ANTRIM which disabled her while she was entering Cumberland Sound enroute to reinforce their Grytvyken garrison. She ended up sinking alongside the jetty there. This event brought us to the realization that we were actually at war and could have fired real torpedoes at a real target full of real people. Furthermore they would probably have a go at us too if we were careless. We became sharp.

23 years later I was chairing a Submarine Rescue Meeting and the Argentine delegate turned out to have been my opposite number on that day. After an embarrassed introduction we exchanged memories. I now know that the SANTE FE had been surfaced and fast throughout that day. So we, having missed seeing her and thereby assuming that she was dived, slow and close searched in the wrong place. "What if" I thought – perhaps he did too.

The recapture of South Georgia happened around us. We watched in disbelieve as the SAS (Army special forces) crashed several helicopters into the Fortuna Glacier while we carried out a periscope reconnaissance looking for a landing site for our SF who were Arctic trained. They were landed by helicopter later after the fall of South Georgia. We were kept out of sight of the Argie prisoners in Grytvyken. They were being returned to Argentina so that they could tell the truth about events and perhaps more importantly our conduct towards them. But they were not allowed to know that we had nuclear submarines already operating in the war zone.

The mood on board was hardening to the task. Earlier we had suffered a minor bump possibly with some ice that had damaged our VHF aerial, and so we lost SSIXS. We were also operating far outside the design coverage of NATO VLF stations. Thus communications had become a problem. An HF broadcast from New Zealand was activated so that we could be talked to but that too was operating at its limits. Our floating VHF aerial required us to surface to deploy it at great hazard of entangling the screw. We spent 2 nervous

days surfaced off South Georgia under the air defense coverage of HMS Antrim's Sea Slug system as the radio maintainer lay along the top of the fin trying to weld the flimsy aluminum framework of the VHF aerial in windy freezing conditions. He succeeded so that we could reliably transmit but not receive SSIXS. We were reduced to literally *cutting and pasting* yards of paper rolls to receive barn-storms. That maintainer was deservedly mentioned in dispatches.

We were moved from the vicinity of South Georgia to an area south of the Falkland Islands. The Argentine naval strategy was developing with their small ex UK carrier and its UK designed escorts to the north, the French A69s to the West and the Belgrano group of ex-USN ships to the south.

Navigation had some chewy problems. The charting of the South Atlantic in those days was haphazard. Before departure I was given the raw survey data (collector sheets) as recent charts had not been published. They were plain black and white and I spent many happy hours on the way south coloring the land and shallows to make them useable as charts. The chart of the north coast of East Falkland had the following encouraging message added *Coast reported to lie 4 miles further north* and the chart of the waters between South Georgia and the Falklands bore the name of the surveyor and the date of survey as Lt J Cook Royal Navy 1774. We took appropriate precautions. We tried to keep to those areas where occasional vessels had operated their echo sounders so that I could interpret the gaps between lines of soundings. We operated the echo sounder continuously and rehearsed slowing down, coming shallow and reversing course in one motion. We met several pinnacles for which that drill proved a life saver. Lt Cook was a good surveyor but probably did not imagine a 4500T nuclear submarine at 20+ knots operating at 600 feet 208 years later when he drew up his charts.

We established our patrol to the south of the Total Exclusion Zone. We knew that the ARA BELGRANO (ex USS PHOENIX) was operating in that sector together with 2 ex USN destroyers of the same vintage. Although old, these ships were a significant threat to the UK Task Force. Their guns and missiles could only be countered by air strikes or submarine torpedoes.

One dull evening contact was gained on a diesel signature where there should not have been one; in the vicinity of Isla de los Estados

near Tierra del Fuego. We sprinted down the bearing for several hours, stopping intermittently to take a look on the hull mounted sonars. On achieving broad band contact and identifying three or four ships we returned to periscope depth. The control room was tense. The Captain took a good look all around and announced four ships in sight. I was (and still am) a bit of a spotter of ships and so he called me to the periscope and invited me to say what I could see. There was BELGRANO in the act of refueling from a commercial tanker accompanied by two destroyers ARA HIPPOLITO BOUCHARD and ARA PIEDRO BUENO, (ex USS BONE DD704 and COLLETT DD730).

We detected no sonar or radar transmissions, so assumed that they were attempting to remain covert. They broke off fueling and started to head ENE towards elements of the UK Task Group. They did not go quickly, no more than 12 knots, they did not zigzag except for some very long leg gentle variations in course which might have been our own errors in course estimation. We reported our contact, went deep, tucked ourselves close astern of the BELGRANO and followed them to the ENE.

The initial detection range proved to have been of the tanker at a range of 105nm. The old and noisy propulsion systems of the warships made easy broadband targets. If anything their noisiness made for confusion. Having gone deep and closed BELGRANO (2 x 4) we came to PD the next day behind the PIEDRO BUENO (also 2 x 4). They had crossed during the night and we picked the wrong guy to trail.

The next day the three warships entered a circular exercise area to the South of the Total Exclusion Zone (TEZ). At about the same time the order came to attack BELGRANO. This was not unexpected. We had gathered earlier in the wardroom and discussed how we would carry out such an attack. It was not a long debate. We had two options; either the new Tigerfish Mod1 dual purpose ASW/ASuW wire-guided weapon or the 50 year old Mk 8 which had been the main RN submarine torpedo of WW2. In its day its rugged design and reliability made it perhaps the best torpedo of its era. It was a 45 knot, gyro-angled unguided diesel torpedo and had an optimum range of 1500yds but would run nearly 10 times that before exhausting its fuel. It needed periscope exposure and the captain's

accurate estimations to derive the fire control solution. The wire guided and modern homing torpedo, Tigerfish, had many weaknesses. It was prone to wire breaks and had an unreliable fuse. More than 2/3 of all weapons fired suffered a wire break and control was lost. This was not a safety issue with an exercise weapon but with a warshot we were less at ease with the prospect of an uncontrolled ASW weapon meandering about nearby. Faced with the challenge of sinking a 14000T armoured ship built in 1938 that was taking no discernable ASW precautions we made the obvious choice and plumped for the contemporaneous Mk 8.

During the peace or war deliberations in London, Buenos Aires and elsewhere we continued to shadow the BELGRANO Task Group. They passed through the circle of the exercise area and reversed course making to cross it again. We by now had permission to conduct the attack and started the approach to the firing position. For the MK 8 the ideal position for discharge is on the beam of the target with an angle on the bow at discharge of 90 degrees plus an angle equal to the speed in kts at a range of 1200—1500 yards with own course equal to the mean torpedo course. This means that the weapons have nearly a zero gyro angle and provided target speed and course are about right the solution is independent of target range. For those of you who don't remember manual TMA techniques this happens when Weapon Speed Across equals Target Speed Across. BELGRANO was at about 10.5 knots steering just north of west. Our Captain taking looks every three minutes or so had to maneuver the boat into a position about ¾ of a mile to the south of the target ending up on a course of 345 at a speed of 4kts so that the periscope would not make a feather.

Three tubes were loaded with Mk8s and the other three with Tigerfish. We had closed up at action stations early and the atmosphere throughout the boat was extraordinary. Everyone had a role even if it was to sit tight and await damage to repair, we were all concentrating intently on the task in hand. The attack drill was conducted as if we were taking part in a demonstration for a training film. It was not a difficult attack, we were well practiced and the mood in the control room was tense but professional. The Captain succeeded in achieving the firing position and by happy chance this put both the escorting destroyers on the other side of the cruiser. At

the moment of firing the XO surprised us all and piped up from his corner of the control room "Do not fire! – gyro angle improving". What he meant was that the torpedo course calculator (a 1940s electro-mechanical computer) showed that the target had not quite yet reached the optimum position. The captain lowered the periscope and simply waited for things to move on by. The XO called out again a short time later "ready now sir" and the periscope slid up into the captain's grasp and he gave the order to fire.

The three Mk 8s were fired with an interval of 3 seconds. The mean gyro angle was zero as intended. During their run we continued to plot the target and when the stop watch of the fire control officer indicated 15 seconds to first impact the captain again raised the periscope. He saw the two weapons hit, the first under the after superstructure and the second just aft of the bow. We all heard the bangs, the whole boat cheered at the first, and again at the second, the third and fourth bangs with all four at a steady interval were a surprise. We afterwards decided that we were listening to the direct path and bottom bounce, which by chance arrived at the same cadence as the firing interval.

Submarines do not hang about after attacking warships. This was a tradition that we found to be a sound practice and so we went deep and fast for a short sprint away before returning to periscope depth, possibly to have a go at the destroyers. We were confronted by the destroyers zig-zagging towards us at high speed. So we went deeper and faster for longer to put distance between us and them as well as to reload. However as there had been no sonar or radar transmissions from them even after the attack, we assumed that chance alone had sent them our way. There were a large number of bangs which we supposed were the destroyers dropping depth charges blind. During this run to the south and east I opened up the latest copy of Jane's Fighting Ships and invited the Captain to indicate where he had seen the weapons hit. He looked down at me with the patient look of an indulgent parent—"I don't sink cruisers every day pilot" he whispered. I put the book away.

Standing down from the attack some of us gathered in the wardroom before returning to our beds. This was interrupted by a huge explosion about an hour after the attack and we closed up at action stations again. Nothing developed so we continued to run

deep and fast and supposed that this was the death cry of the great ship.

Amongst the ships company there was a range of reactions to the events of the day. Some became rather introspective some seemed unaffected most were pragmatic. We were at war in all but name and reasoned that the Argies would have had a go at us if they had detected our presence.

The next day or two we spent patrolling the surrounding area. We were aware of the SAR effort but left it alone. However, when a 2x3 contact broke off from the rescue group and shaped course to the NE towards the UK naval group gathered around the missile-torn wreck of HMS SHEFFIELD. We set off in pursuit. We shadowed the ship at close range overnight and at first light closed up at action stations ready to fire and returned to periscope depth. Through the periscope the large red crosses on the superstructure were conspicuous. It was AUXILIARY BAHIA PARAISO, converted into a hospital ship. Why she was heading towards SHEFFIELD I do not know. Perhaps she was going to assist, perhaps she was going towards the holding area for our hospital ships. We broke off and resumed our patrol areas to the South of the Islands.

The sinking of BELGRANO was the key naval event of the war causing the departure from the scene of all Argentine ships to their 12 mile limit. They never came out again. Onboard we sort of knew that we had changed things so radically, however we were not idle thereafter.

Our patrol area shifted clockwise from South of the Islands to the West between the TEZ and the mainland. There we nearly came a cropper. The floating wire aerial was lost so we had to surface and stream another. In doing so we managed to get part of it wrapped around the screw. At any speed above 8 knots we cavitated freely so had to do something. We surfaced, in darkness and put two men onto the casing in dry suits: the outside engineer (a part-time diver) and one of our sonar operators, a man of colossal fortitude and physical strength. He was (and is) known as *Horse*, if you ever meet him you'll know why. Horse entered the water and swam to the screw, which was of course being held on the shaft brake. In a swim that seemed endless but might have lasted 30 minutes he removed all the aerial wreckage while being thrown into the screw blades by the

running sea. He was hauled out of the water drained of energy and close to being incapable of further movement. I have never seen someone so exhausted—and this was *Horse*. All of this was done in the certain knowledge that if any Argie plane had arrived we would have dived without him. His Distinguished Conduct Medal (DCM) was never so bravely earned.

We continued our clockwise circuit of the islands, never seeing them as we were biasing our patrols towards the mainland. The fighting ashore was now well underway and the four SSNs operating off the Argentine coast were acting as passive warning of air raids. We were told to operate at the 12 mile limit and like the other boats spent some time inside it. We were tasked to conduct an ESM watch from the end of the runways of the Argentine Air Bases and report air raids as they took off. Some boats got very close to the tarmac and were able to identify the aircraft by sight. One found itself being bombed inadvertently as aircraft returning from unsuccessful raids dumped armed bombs into the sea. This was an unexpected tasking and reflects the flexibility of submarines if the crews are well trained and capable of unrestricted operations in shallow water. It was all the more surprising as the older boats had a truly ante-diluvian ESM outfit UA4. Barely capable of reliable operations for a periodic return to periscope depth it was a thing of cathode ray tubes and valves. It warmed up like a 1950s television set but was not half so easy to use. More than 4 or 5 radars in a band and it was swamped. In coastal waters it was at its limit: off an airbase with 2 dozen angry aircraft testing their radar before launch it was all but useless. We knew something was coming our way but until we saw its classification, it was guesswork.

The departure of the Argentine Navy from the conflict had made things rather dull, (for us everything was dull by comparison to sinking a cruiser). However we were in the right place to be directed to find the Type 42 Destroyer ARA HERCULES which was on its way from the south to the north creeping along the coast as far inshore as it dared to go. We did not detect her but intelligence kept us close. I say that we did not detect her but I am convinced I saw her funnel smoke when she ran aground. It was the end of the day so we stayed at the extremes of territorial waters. She had been damaged in this incident so we ran ahead to the entrance to the Golfo

de San Matias, a large bay which she would have to cross to reach home. The entrance is greater than 24 miles across so she would have to leave safe water unless she went around the inside. We waited but failed to see her. We assumed that she had taken the long way round inside the bay and we decided to go take a look-see. This was another interesting navigational challenge. The area of chart on which we where to navigate was a little smaller than a post card: approximately 5 miles to the inch. Depths were uncertain and the echo sounder kept us safe. We did a swift circuit keeping just in sight of land before departing and finding ourselves homeward bound, because the fighting had stopped.

The communications difficulties for the latter part of the trip had isolated us from much of the more hysterical and jingoistic coverage. On the way north we didn't dwell much on what had happened or what the news would have been saying about us. Some had more personal things to occupy us: my first child had been born on 13 May and I was keen for a mail drop with photos of her and family news. The trip north was uneventful and spent polishing the patrol report and preparing the inevitable briefings. On resuming reliable VLF coverage the admin signals started to build up with detailed arrival plans. We were the third boat to return so interest was still huge—far in excess of our expectations. Our first clue was being met in the River Clyde while preparing the casing for entering harbour by a small training ship crammed to the gunwhales with Sea Cadets which endlessly circled the stationary submarine while they gave us three cheers about 50 times.

If you have ever visited Faslane you'll remember the narrow entrance past a long low spit. This was covered with camera teams filming our arrival, some of whom in search for the best angle were wading knee deep. They were taking their lives in their hands as our minimum safe speed for pilotage was 8 knots and the wake at that speed was not small. From the bridge we could hear their shrieks of disappointment as our wake and that of the accompanying tug flooded their thigh boots and splashed their lenses and caused a wave of panic through the throng. We didn't find it funny—hilarious yes, funny no.

The base was also crowded, the jetty was swathed in guests, spectators, a band, a bevy of senior officers and most importantly for

me a diminutive blond figure at the back holding up a pink bundle—my 7 week old daughter. The captain gave command to the XO and went below to dress appropriately. The XO and I finished the alongside and got the boat secured with a plank across. However, there was a problem: about 500 people wanted to get on board and 100 guys onboard wanted to get off—across a 3 foot wide gangplank. This problem was made more complicated by a gang of aggressive press who wanted interviews and a shore organization that wanted us all in a reception hall for official speachifying. I wanted to go home, I rather fancy the other 99 did too.

In the event the authorities brought us ashore in ones and twos. As a new father I was one of the first and the hounds from the press surrounded my wife, daughter and I and started the usual inane questions that start "how does it feel to....". I remember being rude to them all except a wee lass from one of the better papers who remembered her manners and her pleases and thank-yous. We awoke the next morning (Sunday) to find that, despite my rudeness, the three of us were frontpage news in every paper—I have kept some of the photos for her wedding (which I hope may be soon).

Normality returned swiftly. We were promised a long maintenance period and at least two months before we would be sent south to maintain the post-war sea dominance. However, 5 weeks later we were at 75 North chasing shadows on SOSUS.■

STORY OF USS FLIER 2ND PATROL AND ITS SURVIVORS PART III OF III PARTS

by Mr. Alvin E. Jacobson

This account of several submariners' heroic efforts to survive the sinking of FLIER in the Japanese-held Philippines came to THE SUBMARINE REVIEW through the courtesy of Captain Herb Mandell, a WW II submariner and author of Submarine Captain and Command at Sea. This account was self-published in 1997 by Mr. Jacobson, who had been a Junior Officer in FLIER, and was revised by him in 2002. Some draft copies had been circulated several years ago and it is possible that the article has been published or excerpted in other venues. Captain Mandell has arranged with Mr. Jacobson for permission to publish his story in these pages. It is with gratitude that the REVIEW can give wide distribution to this important piece of the World War II submarine story.

On her second war patrol in August of 1944, USS FLIER (SS 250) was directed through Balabac Straits south of Palawan Island in the Philippines to attack a Japanese convoy on the surface at night with the Captain, four officers and four lookouts on the bridge. At about 2200 the ship hit a mine and started to go under. Only those on the bridge and a few from the conning tower were able to get off the ship. They were in the water for about 17 hours before the eight survivors of the sinking and the swim got to an island. Part I described the sinking, the swim, the island and the decision to swim to another island.

In Part II the survivors made preparations for the swim to island #2, in the direction away from a known Japanese town. They rafted and swam over 4 hours to get there, not finding any edibles. The next day they went on to island #3. On the sixth day they went to island #4 where they had seen houses. There they made contact with friendly guerillas, who started them on the road to rescue.

That day we spent inspecting the outpost and talking with the guerrillas. We had a real treat for dinner: caribou meat, cut so thin it was like paper. Even then you could just barely chew it. They had also fixed coconut in a new form; they made a spread out of coconut and honey that was great.

The outpost was made up of one bamboo building about forty by fifty feet, built on stilts and six feet off the ground. Below and around the edge of this house were a series of trenches. The guerrillas could drop from the house into these trenches and repel any attack from the beach. Other things around the house were items we were later to find around all the settlements; a big pot to boil down salt water to get salt, a small clearing to raise sugar cane, a few skinny chickens and a cistern to collect rain water from the roof.

It was now the 10th day of our journey. The wind was favorable, so it would be safe to start sailing after the scheduled 1500 Japanese Patrol. So shortly after 1500 we set sail. The Sergeant, the sailor, Kim Jon, and the new member of our party, Kong, were with us. Kong helped Kim Jon do the rowing. Pedro departed to organize a search of the surrounding islands to see if anyone else had gotten off the submarine. He had previously sent people to all the islands but wanted to check again.

The wind and sea were favorable when we left and our hopes were so high that we thought we could make the seventy miles by next morning. It was about 1730, when we had settled down to a comfortable pace that the Sailor, without much warning, started to head for the beach and spoke to the Sergeant in their native tongue. This aroused our suspicion, and after quizzing the Sergeant, he pointed out towards the sea and told us, as we could see, that a Japanese patrol was passing by. We dropped our sail, which cut down our silhouette, so they could not see us. By this time the boat had gone by, it had become dark and the wind had died down. For the next few hours, the Sergeant, the Sailor, Kim Jon and Kong took turns rowing. Later the wind came up again and the sailing became very pleasant. For supper that night, the Sailor had cooked us rice in his improvised galley. This galley consisted of a two-foot square sheet of steel, which he laid on the deck. On this steel he built an open fire. Then from a tripod arrangement he hung a pot to cook the rice.

About 0300 it was decided that we couldn't make the headquarters without traveling too much in daylight. So they rowed us about two miles up the Tuba River to the homes of natives. He and his wife and family accepted us very graciously and made room for us in their house. We slept there until the morning, and found when we awoke that our host had killed one of his pet chickens and was cooking it for our dinner. This met with great approval, but we were sorry to see that they had made such a sacrifice.

After the 1500 patrol we continued our journey. This time our party had grown. Our host's daughter had just married and he asked if it would be possible for the bride and groom to travel with us. Of course, after his hospitality, we had no choice. However, the party did not stop with just the newlyweds, they brought chicken, rice, and many other articles with them; so now our boat was loaded until it had about two inches of freeboard. In fact there was only sitting room for us with no room to move or stretch.

The Sailor did not leave with us, but instead ran ahead, and we were told he would join us later. We had become so fond of him that we were sorry to see him go. After a couple of hours, when we were a few miles off shore, we saw a man swimming in the water out to us. It turned out to be the Sailor, who, we were told, had stopped off to see his family. He brought back with him a new way of fixing rice in the form of pancakes. Shortly after joining us again, he cooked our evening meal and resumed his duties. The Sailor's duties included about everything in the book and he would do them all at the same time. For example, he would be handling the tiller with one foot, rowing with the other foot, handling the sheet with his teeth, sewing up a hole in Baumgart's pants and cooking our meal, all at the same time.

At 0600 we noticed several boats ahead of us, and as we approached we saw that they were boncas with natives diving for fish and spearing them under water. A bonca is basically an outrigger type of canoe with a sail. They turned out to be friends of the Sailor's and they gave us some fish. Later on the Sailor cooked an eel and two other types of fish. The eel, after it was skinned, was very tasty.

The wind was favorable but not very strong. We were sailing along when there began a lot of shouting. Our sails were immedi-

ately dropped, and we were amazed when another boat came alongside. It seems that this boat belonged to a friend of the Sergeant and the Sailor, who had just come from where we were heading. The Sergeant was anxious to know if there were any signs of the enemy ahead. They reported that there were none and departed.

While we were sailing, Kong would roll a cigarette and smoke it. Russo and Baumgart decided that they would like a smoke, so Kong rolled them one out of native tobacco and split *Napa* leaf for the paper. They claimed the cigarette was so strong it felt like hot tar going down the throat. It gave them a tobacco cure for a while.

The whole time we were sailing, we were going among reefs and hidden rocks, and it was very satisfying to see the way the Sailor seemed to know where each one was located. About 0530 we rounded the point that formed the bay where the headquarters stood. After much shouting by the Sergeant the guerilla lookout was awakened, and told to notify their captain that we were coming. About 0800 we landed the boat and were greeted by an army of guerrillas and their captain. Their Captain identified himself as Captain Nazario B Mayor USA FFE, Acting Commanding Officer of Section D of Sixth Military District, and invited us to his home, which was about two blocks off the beach.

Captain Mayor was a native Filipino who had graduated from the University of Kansas where he had received a commission in the U.S. Army through the R.O.T.C. We later found out that the house on Bugsuk Island, where we had first landed, was his home. He had been running a profitable lumbering business when the war started. When the Japanese came, he had to hide his tractors and equipment in the jungle, abandon his home, and destroy all his records and escape to the jungle.

We were still unable to walk very well and must have appeared a very disappointing sight to the guerrillas as examples of American soldiers. It was not only our sores that disabled us but also we had been so crowded together and unable to move while we sat on the hard wood deck of the sailboat that we were stiff.

On the way to Captain Mayor's home, we met Mr. T. H. Edwards, whom we were later to know as a great friend. Mr. T. H. Edwards, an American citizen, was in business at Brook's Point before the war and now in evacuation. We reached the house and

met Mrs. Mayor and the rest of the family, plus many natives. They invited us to wash up and started to prepare a good meal. The Captain's wife spoke English and had a formal education.

We were not at their home very long when Sergeant Amado S. Corpus, who was in charge of the U.S. Army Signal Corps *Coast Watcher* Unit stationed there, introduced himself. He was a great sight for he was an American born Filipino and this was the first time that we could feel completely relaxed. No matter how assuring the natives were, "you still had a doubt about where their loyalties lay".

We now found out that there would be a chance to contact Australia and ask for help. Our first worry was to get news to ComTask Force Seventy-One to warn him not to send any more ships through Balabac Strait.

Mrs. Mayor now had dinner ready and we sat down to a meal that was served in a crude form but showed signs of fashion.

It was decided that because of our poor physical condition and the fact that is would be unsafe for us should the Japanese come around that we were to go to the home of Mr. Edwards, which was about three miles inland. The Coastwatcher had a radio there to contact Australia. After dinner Captain Mayor arranged for two caribou carts to carry us back to the home of Mr. Edwards.

This trip proved very amusing. The caribou that was hitched to the cart that drew the Captain and four of us was an older bull. It was during the hot afternoon that we made the trip and unfortunately it had rained the day before. So about every hundred yards there was a mud wallow in which the caribou would lie down. The native boy would hit him and kick him as much as he could but the bull would not move until he wanted to do so. Thus, the trip took us all afternoon and we didn't reach Mr. Edward's house until 1700.

As we came up to a stream, we saw the house, and saw Mr. Edwards working on the rice mill. He greeted us very cheerfully and sent his native boy to the house to make it ready for us. When we arrived, we were greeted by Mrs. Edwards and the rest of the Signal Corps Group, plus Bill Wigfield and George Marquez of the U.S. Army, Chuck Watkins S1C U.S. Navy Air (they were Japanese prisoners that had escaped and now lived in the area), as well as Henry Garretson, a U.S. Citizen. The house was made of bamboo

and built on stilts and as native as almost any of the houses we had been in, except that it was larger and had chairs and other indications of civilization.

Next to the house was a house built by Captain Mayor as a retreat for his family in case the Japanese landed. However, due to the Malaria around there, Captain Mayor kept his family down at the beach.

There was room for only three of us in Mr. Edward's home so the officers stayed there and the other men stayed with the Coastwatcher Group in Captain Mayor's home.

The Coastwatcher Group brought out their medicine kit and we were finally able to get sulfa and other medicine on our cuts. We also received cigarettes, soap and some clothes. In fact, we even had some coffee, and cheese and crackers. These were the emergency rations of the Coastwatchers.

Our first task was to send a message back to Australia, so the Captain made out a message and gave it to the Coastwatchers to send.

We were fed a good meal of coconut sprouts, rice, kalamayhatii, and a fruit similar to grapefruit. After dinner, Mr. Edwards brought out the news reports for the last few days, the reports being those that the Coastwatchers received over the radio every night and typed up for the people around the area. This brought us up to date with the outside world. We also realized what an important factor these news reports were for the guerrillas. That night we slept as peacefully as any person could.

The next few days were spent lying around and recuperating, talking to the natives, the Coastwatchers, and Charlie, Bill, and George. Of course, our main project was communicating with Australia and arranging to be picked up.

Our first day there, Mr. A.M. Sutherland, A Scottish Missionary, came to visit us. He was a fine person. At the Captain's request, the next morning we held a church service, which was very impressive. The Edward's, being very religious people, further helped to make this service as fine as could be.

Shortly after we had arrived, Mr. Edwards had dispatched a native to get a native doctor who was a short ways away. The following day he came with what little medicine he had. However,

we had more faith in our medical care; but, to humor him, we let him change our dressings. The primary medical care that we had was attabrine, from the Coastwatchers' supplies and we started taking it faithfully every day.

It was decided that haircuts would improve our appearance, so the Coastwatchers got the native lady that they had trained to give us all haircuts.

It had been arranged before we arrived that the native girls from the village would give the Coastwatcher boys a party. This meant tuba for all of them. Tuba is a white sap that they drain from coconut blossoms and is about as strong as beer. So the boys dressed up in their best suits of coveralls and started out for the party.

Sergeant Corpus, however, did not leave at the same time as the rest of the boys, and before they had gotten a half-mile away, they heard a shot; and when they returned to investigate, they found that Sergeant Corpus had shot himself. Immediately we called off the party. They managed to scrape together enough boards to make a coffin, but the wood was so scarce that they made a close fitting box. It was later revealed that Sergeant Corpus felt it was his fault that we were sunk. He felt that he should have known that Balabac Strait was mined and reported the fact to Australia.

At a later date we did get a chance to taste the 'tuba'. I wouldn't want it as my choice for a drink.

We had one scare while waiting around. One afternoon we heard an explosion that sounded like gunfire down on the beach. This brought us all to our feet and we ran to the top of the nearby hill to see if any landing boats had come into the bay. To our delight there was nothing around to cause alarm. We didn't find out what it was. It must have been some native activity.

From the house we were in, we could see Japanese coastal boats sail by all day long, which was the only indication that there was still an enemy around.

I amused myself during this time by reading six-year-old copies of Reader's Digest, and making cribbage boards and other things out of bamboo. I was not, however successful in making a comfortable pair of sandals that did not rub on some of the sores on my feet; so I was still bare footed. One of the days when I was tired of sitting around, I decided to go hunting wild boar with George Marquez. We

borrowed a carbine from the Coastwatchers, but, though we saw several boars, we were unable to hit one. They moved so fast and the underbrush was so thick. We did, however, get one bird.

The only thing of merit that I really accomplished during our stay at the Edwards' place was to fix a belt for Mr. Edwards' rice mill. Mr. Edwards was very grateful. This rice mill was driven by a diesel engine, which Mr. Edwards had managed to salvage from his previous home. The fuel for it was furnished by the Japanese through barrels of oil that had drifted up on the beach from sunken ships.

The arrangements for being picked up were made by Captain Crowley. After finding out that the District *Dato* had two large kumpits and an outboard motor, we sent a message to request the use of them. This would give us means of reaching any submarine that might come in.

We next had to decide where would be the best place to be picked up. We consulted some Japanese charts that had been taken from a Japanese supply boat that had run aground at the other end of the island. The charts were used by the people as paper for printing money, because there was no other paper like it here. The place we decided upon was right off where we were located. We also arranged a series of signal lights whereby the arriving submarine would know approximately where we would be. We arranged to have three large lanterns hung in a row on an abandoned radio tower down on the point. When all the arrangements were made, we were sent a message saying that USS REDFIN would be there to meet us about 2000 the following night.

Ever since we arrived at Mr. Edwards' place, we had heard about Mr. Vans Trivo Kierson, a citizen of Finland who was a seaman, diver, and engineer. They hoped he would be back in time to leave with us. The night before we were to leave he arrived and we met him. He is one of the most interesting people I've ever met. He had just returned from visiting the native villages on the island to get enough rice to feed the guerrillas. This was a tough job, because most of the natives did not have enough rice for themselves. However, he came back with several kilos of rice and promises for enough to supply the guerrillas for the next six months. One of his approaches was to swap with the chiefs of the village's rice for some beer or whiskey that he had managed to salvage from a Japanese

supply ship that had run aground on one part of the island. When the day for us to leave was finally known, we notified the non-native people in the area that we would be leaving the next day, and for them to dispose of their personal belongings in less than twelve hours. We arose early and started our walk back to Captain Mayor's at the beach. We were in much better shape by now and some of us were able to walk a good share of the distance.

On our way down to the Coast we were not able to see the bay, and when we arrived at the Captain's, we had a great surprise waiting for us. For the first time since the beginning of the war a Japanese Maru (coastal ship) had anchored off the spot where we were to be picked up. We immediately assumed that the Japanese knew we were there and were just waiting for the submarine to come in. Our spirits hit low ebb. However, we continued our plans and organized the party that was to leave with us. This party consisted of Mr. and Mrs. A.M. Sutherland (British Missionaires) and their two children who were six and three years old, Mr. Kierson (The Finnish Engineer), George Marquez, William Wigfield (U.S. Army), Charles O. Watkins (U.S. Navy), and Henry Garretson (a U.S. citizen). This made for a total of eight FLIER survivors and nine others for a total of seventeen people.

Chief Howell had not gone back to the Edwards' with us, but, rather stayed down on the Coast to repair one of the Coastwatchers' radios that was broken; he joined us at this time and reported that the transmitter radio was in working order now.

That afternoon, the Captain and Jim Liddell went along the beach to investigate the Japanese coastal ship that was anchored. They decided that we wouldn't be able to show our signal lights, but we would try to go around the anchored ship and meet REDFIN. The Coastwatchers had two portable transmitter radios, one to be on the beach, and the other to go in the kumpit with us. Thus, we would be able to communicate between the beach, the kumpit and REDFIN.

After dusk, at 2000 we began sending out our call to REDFIN. We found out that the unit we had on the beach wouldn't work, so we started calling REDFIN with the unit we had in the kumpit, but we did not get any reply from them. After trying for quite some time with no luck, we became discouraged because none of the plans we had made were working. We had no signal lights on the beach and

after two hours of trying we were receiving no signals from the REDFIN. We started out with the kumpit, which had the outboard motor towing the other kumpit. We went down the coast about three or four miles and made a big circle around the anchored Japanese ship. All this time we were turning the generator crank on the radio and calling the REDFIN in every way we could, but we will had no reply.

After another hour and a half, at around 2330 we finally heard what we thought was a reply by REDFIN. This boosted our hopes, but we could not locate them. They told us to use C.W. Keying because the voice was too weak. We told REDFIN that we would flash a light and ask them if they could see us. We did this several times, but still did not hear from them again or see them anywhere. We repeated this flashing several more times and by this time there were several people claiming that they could hear the submarine engines, but we thought this was only imagination as we couldn't see the sub. Then at 0053 we received the word to stop the flashing because they had spotted us. Soon after that we saw them!

At 0100 REDFIN passed close and its skipper recognized Commander Crowley's voice, so they came along side of us. When somebody reached out their hand to pull me aboard, I didn't hesitate or ask permission to come aboard!

After much handshaking and other means of expression, we told the skipper of REDFIN what we thought the guerrillas needed most, and he really gave them about everything he could spare aboard the submarine. This consisted of guns, ammunition, food, medicine, and clothing. A special item was a pair of size 9½ shoes for Mr. Edwards. When the two kumpits left the side of the submarine they were loaded to the gunnels and the only worry was to keep them from capsizing.

As a parting gesture to the natives and Coastwatchers we were to sink the Japanese ship and they could get the salvage supplies. Unfortunately we were unable to sink it.

The trip back to Australia was spent having the pharmacists's mate doctor our cuts and feed us quinine and attabrine. Tremaine started to get his attacks of malaria during the trip but the rest of us were quickly getting well.

The morning of September 6, 1944 we saw the port of Darwin,

Australia and then realized it was all over. We stayed in Darwin that day and night where we received some clothes from the Army. The clothes were some that were to be sent to the guerrillas in the islands, so they told us to help ourselves.

The next day Admiral Christy's private plane flew up from Perth and flew us back to Perth. This was a twelve-hour flight so we arrived there about 2300. Lt. Bob Hanson was the pilot and a very good one, too. We were met at the airport by the Chief of Staff and two Captains. They personally drove us into town and there we split up. The Captain went to the Admiral's home to stay; Jim and I had a suite of rooms in a B.O.Q.; and the rest of the men went to quarters in another part of town.

We were given two days to draw some pay, obtain a clothing allowance, purchase daily clothing and order uniforms. All of us, except the Captain, were flown 300 miles inland to the town of Kalgoorlie. The Admiral did not think it was a good idea for us to be around sailors who were going back out to sea.

Kalgoorlie was the gold mining town where President Herbert Hoover made his money and they were still mining gold. Jim and I stayed in the home of the mine manager. One day the manager suggested to me that I go to the mine at 0600 to witness the strength of the unions in Australia. At 0600 the union leader shouted "Are we going to work today?" A loud "no" was the response. The manager turned to me and said that his orders were to run the mine to full capacity. This same routine happened each morning for the remainder of the week. This was their annual race week with horse races every day.

After ten days we were flown back to Perth. My uniforms were finished and pay records were completed. In two days I had my new orders so I was flown to the states in a *China Clipper* plane for a two-week vacation at home. I reported to Boston Navy Yard for a new construction on the submarine USS LING. I do not know where the other seven men reported.

P.S. USS LING was in the Panama Canal on its way to the Pacific when the war ended.■

2008 Submarine History Seminar
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A historical look at the scientific, strategic and operational aspects of submarine arctic operations

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CAPT Merrill Dorman, Artic Operations
CAPT Robert Perry, Recent Operations
CAPT George Newton, Moderator

TACAMO – THE SURVIVABLE FINGER ON THE TRIGGER

by Mr. Jamie Bisher

Jamie Bisher worked as a junior engineer for a support contractor in the Naval Air Systems Command TACAMO Engineering Office (AIR-53342) 1981-1984.

Submarine communications have occupied strategists, worried submariners and fascinated the public since World War I. For half a century, the mission of submarine communications was straightforward: simply to transfer mission support and minimal command and control information to distant boats whose independent commanders were accustomed to relying on experience, instinct and initiative. Then came the Cold War: Nikita Krushchev and the aggressive, formidable Russian threat of the early 1960s made survivable submarine communications a key to nuclear deterrence. This threat begat TACAMO, a naval oddity that entails cutting edge technology, a port in Oklahoma and the heaviest aircraft in the fleet inventory twirling wires five miles long in the sky.

In 1963, Soviet technological advances and the absolute necessity for assuring the twin objectives of the strategic Submarine Force—survivability and effectiveness—forced US naval planners to acknowledge that contemporary methods of submarine communications were dangerously outmoded. The haste with which a new submarine communications project was launched suggests the urgency felt by Washington. The proposed solution was an airborne communications concept, a cutting edge, high-risk idea fraught with technological risk. The solution was the responsibility of Rear Admiral Bernard F. Roeder, Director of Naval Communications, who thrust the concept upon young Lieutenant Jerry O. Tuttle and ordered, "TAke Charge And Move Out!" The project became the namesake of Roeder's memorable order—TACAMO, a moniker that would baffle hostiles and friendlies alike for decades.[1]

TACAMO initially took flight with a Lockheed KC-130 Hercules shanghaied from the Marine Corps. Engineers equipped the aircraft with a very low frequency (VLF) radio transmitter and sent it to communicate with the subsurface force. The experiment succeeded, and, as a result, four Air Force C-130s were diverted from the Lockheed production line to the Navy, christened C-130Gs, and stuffed with a roll-on/roll-off van of strange communications hardware. In 1966 the Navy expanded the TACAMO program. As a result, eight new EC-130Q aircraft with fixed communications suites were ordered, and a new unit, Fleet Air Reconnaisance Squadron FOUR (VQ-4), was established at Naval Air Station Patuxent River, Maryland. A TACAMO contingent at Barbers Point, Hawaii evolved into a Pacific squadron, VQ-3, that was soon moved to Agana, Guam.

It was the beginning of a twenty five-year vigil for the EC-130s of VQ-3 and VQ-4. TACAMO was working *24/7* years before the term came into common use: one aircraft over the Atlantic, another over the Pacific, and others on the ground on 15-minute alert, constantly until the end of the Cold War. Each flight departed just in case the unthinkable—a nuclear attack on the United States—might happen during the next ten and a half hours.[2] They were the link between the National Command Authority (NCA) and the strategic submarine fleet, the finger on America's nuclear trigger. The other links—a number of fixed VLF and LF shore stations—were doomed in a global nuclear exchange. However, TACAMO was a moving target and deemed *survivable.*

Survivability demanded rigorous operational security measures. TACAMO aircraft would start a mission from one airfield and end at another, and fly random patterns to mislead *unauthorized observers.* Even tail numbers were classified confidential. Rumors circulated of suspicious civilian vehicles and watercraft lurking around bases, but no arrests were made, or rather, no arrests were made *public.* TACAMO certainly aroused interest in Soviet intelligence.

Submarine communications have always pushed the envelope of technology. In the first days of World War I, the German Admiralty took over Telefunken's famous Nauen *wireless* station near Berlin, and in 1918 used it to command *undersea cruiser* operations off the

coasts of New England and West Africa. During World War II German scientists constructed the Goliath VLF station near Magdeburg, a huge contraption true to its name with an antenna two-thirds the height of the Eifel Tower. Goliath's signals could be received by submerged U-boats off Capetown and in the Strait of Malacca. The Soviet Navy inherited Goliath during the Allied occupation in 1945, and eventually developed a powerful extremely low frequency (ELF) transmitter near Murmansk. In the United States, controversy over the environmental impact of ELF transmissions brought submarine communications into the public eye. The plot of the 1995 movie Crimson Tide hinged upon the difficulty and dire consequences of submarine communications.

TACAMO communications equipment has always been extraordinary. EC-130s carried the usual complement of ultra-high frequency (UHF), HF and satellite communications (SATCOM) gear to communicate with surface ships, shore stations and other aircraft. However, TACAMO VLF equipment was unique: in the 1970s and 1980s, it entailed a 200-kilowatt (kW) transmitter that transmitted over two trailing wire antennas, one five miles long, the other two miles long. Since VLF transmissions require a stationary vertical antenna, the EC-130 had to slow to a near-stall and fly a tight two-to-three minute orbit to broadcast. Transmissions trickled into the submarine at extremely low data rates via an external antenna to the VERy low frequency Digital Information Network (VERDIN) terminal, which were reserved for fateful Emergency Action Messages (EAMs) such as terse orders to launch, stand-down or surface for more verbose orders across a broader bandwidth. TACAMO could also relay EAMs from the Emergency Rocket Communications System (ERCS), a Minuteman II missile which would broadcast prerecorded force execution messages to all units within line of sight of the missile's apogee flight, presumably in case the National Command Authority was unavailable or had become extinct. Survivability also demanded that the aircraft be shielded for electromagnetic pulse (EMP), so a massive wooden scaffold held together by huge wooden screws was constructed in New Mexico, strong enough to support an EC-130 during EMP tests. The airplane was so heavy that it regularly raced down 5,000 feet of runway before climbing into the air, prompting at least one crewmember to

add *three 'Hail Mary's' and an 'Our Father'* to his regular checklist.[3]

A veil of mystery has surrounded TACAMO since its' inception. Indeed, the mission's secrecy bred fanciful tales in the first decades of the program, and mischievous airmen added to the hysteria by making up wild stories. A VQ-3 crew that frequently landed at Hickam Air Force Base let slip to overly curious technicians that their EC-130 actually carried a nuclear reactor onboard. The bizarre orange cones on the tips of the trailing wire antennas contributed to the nuclear aura. One night, an innovative reel operator cut open a light-stick and dribbled the luminescent chemicals on his flightsuit and face. After the aircraft parked, the Air Force technicians tried to steal a peek inside the aft doors. Out of the dark interior appeared the the glowing reel operator, frantic, running and shouting, *Reactor breach!* His colleagues hustled him onto the crew bus and raced away, leaving three shaken young airmen, one snickering Senior Chief and one smiling Master Sergeant.[4] The patch of the VQ-4 depicts the silhouette of someone in a fedora and trenchcoat grasping three lightning bolts, contributing to a mistaken belief that the *Shadows* (as they are known) are a *spook* squadron. Even now that the mission is public knowledge, TACAMO continues to inspire the imaginations of conspiracy theorists. Some websites associate the aircraft with *the Taos hum* and paranoid *chem-trail* conspiracies.

The mission of 21st century TACAMO has expanded to encompass the entire US nuclear triad. The evolution began in 1989 when VQ-3 took the first of sixteen Boeing E-6A Mercurys that would replace the EC-130 by 1992. The E-6As were the last of the 707 line, and their 320B airframes were modified to accommodate the trailing wire antennas (one under the mid-fuselage and the other from the tail cone), mount electronic equipment in enlarged wing tip pods, strengthen the fuselage structure to support the hefty communications suite, and harden the aircraft for EMP and nuclear blast. VQ-4 received its first E-6A in January 1991, and moved to Tinker Air Force Base, Oklahoma in November 1992. In 1995 a 737-type autothrottle and a software revision to the flight management computer incorporating a TACAMO orbit algorithm fine-tuned the maneuver required to broadcast VLF messages. In 1997, the Navy started converting the Mercurys to E-6Bs to replace the Air Force's

aging EC-135 Airborne Command Posts. This dual mission began in October 1998. To accomplish it, Strategic Communications Wing One, the umbrella for VQ-3 and VQ-4, flies the heaviest aircraft ever fielded by the Navy at 350,000 pounds, yet has a mission range of 6,600 nautical miles and endurance of fifteen hours without refueling and 72 hours with in-flight refueling.

A sizeable community of military personnel and civilians has evolved to support the TACAMO mission. By the early 1990s, VQ-4 grew into one of the largest operational aviation squadrons in the Navy, with approximately 400 officers and enlisted personnel. Over the years, thousands of people have worked in the program—pilots and other aircrew, maintainers, engineers, technicians, logisticians, administrators, assemblers and many others in uniform, in the civil service and in industry. Their collective efforts during the past forty years have enabled our strategic submarine fleet and dispelled the fear of annihilation that originally spawned TACAMO.■

ENDNOTES

1. Geels, Tim, "TACAMO: Navy finds its port in the heartland!," Tinker Take Off, February 11, 2005, Tinker AFB, OK.
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SUBMARINE WARFARE VS. ENEMY MERCHANT SHIPPING

by LCDR Michael L. Kramer, USN

> *The submarine has the smallest value of any naval vessel for the direct attack upon trade. She does not carry a crew that is capable of taking charge of a prize; she cannot remove passengers and other persons if she wishes to sink one.*[1]
>
> -- Alfred Thayer Mahan
> *The Influence of Sea Power upon History, 1660–1783*

If the United States were to become engaged in international armed conflict with the People's Republic of China (PRC), the National Command Authority might issue the order, "Execute unrestricted submarine warfare," as they did at the onset of World War II. The thesis of this paper is the answer to the question that a future Joint Task Force (JTF) Commander charged with defending Taiwan against the PRC might one day ask in regard to Chinese merchant shipping,[2] "Can I kill them with my subs?" In short the answer is: yes it is acceptable under the U.S. interpretation of international law, but it will not likely be authorized by the rules of engagement. This is why.

Notional Scenario

In a fictitious scenario built by the Joint Military Operations Department of the Naval War College in December 2006, the United States is called upon to defend Taiwan against aggression from the PRC. In the scenario, relations between the PRC and Taiwan have strained, and Taiwan elected a pro-independence president who proposed Taiwan's admission to the United Nations. The PRC conducted large scale missile, naval, amphibious and air exercises, with missiles fired in the vicinity of Kaohsiung, Taiwan. Unification talks were started, but soon broke down completely. Eventually, the PRC seized and occupied Quemoy Island[3] with significant PRC and Taiwan losses. The United Nations resuscitated talks between the two parties, but these soon broke down as well. World reaction was

generally muted, as many countries saw the matter as an internal conflict. Eventually, the PRC built up amphibious forces opposite Matsu Islands,[4] the U.S. conducted non-combatant evacuation operations, and Taiwan mobilized its reserve forces. Taiwan asked for U.S. assistance in its defense and the United States responded by establishing a coalition to defend Taiwan and deter PRC aggression. One issue raised by this scenario is: Would unrestricted submarine warfare against PRC merchant vessels be legal during the operation?[5]

This paper will first provide a brief analysis of the law governing the attack of enemy merchant shipping. It will show that submarine warfare against enemy merchant shipping is within the bounds of lawful conduct. However, that judgment is based on an expansive view of customary international law. The United States holds this view even though most of the rest of the countries of the world, including many of our allies, do not. Second, this paper will discuss briefly the history of unrestricted submarine warfare with particular attention toward interdiction of enemy merchant shipping. The point of this section of the paper is to show that belligerents in the 20th century generally recognized that unrestricted submarine warfare was on the edge of lawful conduct and perhaps even unlawful. It will further show that submarine warfare has historically played a disproportionate role in influencing policy makers. This paper will conclude that even though attacking enemy merchant shipping in certain circumstances is considered lawful, it should not be authorized under the rules of engagement (ROE) because such actions would significantly reduce the legitimacy of U.S. operations. Operations that lack legitimacy undermine U.S. efforts.

Interdiction of Enemy Merchants Shipping Under International Law

Many *fault lines* in the law of war have been addressed in recent literature.[6] One such fault line that has not received that much attention is the attack on enemy merchant shipping by submarines. According to the U.S. Navy Commander's Handbook on the Law of Naval Warfare, the "rules of naval warfare pertaining to submarine operations against enemy merchant shipping constitute one of the least developed areas of the law of armed conflict."[7]

Are enemy merchant vessels lawful targets? First of all, in order for an object to be lawfully targeted, it must be a military objective and not a civilian object. According to the 1977 Additional Protocol I (API) to the 1949 Geneva Conventions,[8] in "order to ensure respect for and protection of civilian population and civilian objects, the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives...."[9] The Commander's Handbook states that civilian "objects consist of all civilian property and activities other than those used to support or sustain the enemy's war-fighting capability."[10] Furthermore, the API requires that the warring parties "shall direct their operations only against military objectives."[11] The API provides further relevant prohibitions. Under Article 51, "Civilian objects shall not be the object of attack," and the "civilian population as such, as well as individual civilians, shall not be the object of attack."[12]

The API defines civilian objects as "all objects which are not military objectives."[13] The crux of the matter is whether PRC merchant vessels are military objectives, since only military objectives may be attacked. What are military objectives? This is not an easy question to answer and even the drafters of the API noted that the API text "certainly constitutes a valuable guide, but it will not always be easy to interpret, particularly for those who have to decide about an attack and on the means and methods to be used."[14] Indeed, under the API military objectives are "limited to those objects which by their nature,[15] location,[16] purpose,[17] or use[18] make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage."[19]

Interpreting this article broadly, the Commander's Handbook states that military objectives include "economic targets of the enemy that indirectly but effectively support and *sustain the enemy's war-fighting capability* [and] may also be attacked."[20] The United States considers this customary international law[21] and the Commander's Handbook refers to the destruction of Confederate cotton within the South by Union forces as an example of justified targeting of economic objects.[22]

On the other hand, a more restrictive reading of this article

focuses on the plain meaning of the phrases, *make an effective contribution to military action* and *offers a definite military advantage*. This interpretation would require that "there ... be a definite military advantage for every military objective that is attacked"[23]—a closer link between the object and the conflict. Many states—including most of our allies—have moved to the more restrictive interpretation. The U.S. is one of the few holdouts of the expansive view of military objective.

Additionally an attack must apply the rule of proportionality. The Commander's Handbook states that "it is not unlawful to cause incidental injury to civilians, or collateral damage to civilian objects, during an attack upon a legitimate military objective" but that injury or damage "must not ... be excessive in light of the military advantage anticipated by the attack."[24]

An additional complication in this calculation, as one noted legal scholar recognized, is "whether it is permissible to take own-forces survival into consideration when deciding if, when, and how attacks may be mounted."[25] Although the London Protocol does not allow for this, the Commander's Handbook does. The London Protocol "makes no distinction between submarines and surface warships with respect to attacks upon enemy merchant shipping."[26] It requires that submarines must first safeguard passengers and crews of enemy merchant ships before an attack, except in cases where a ship persistently refuses to stop after having been ordered to do so. This requirement is more restrictive than the one imposed by the Commander's Handbook. U.S. Navy doctrine reflects this view.

According to the Commander's Handbook, the basis of the law governing submarine interdiction of enemy merchant shipping is the London Protocol of 1936 "*coupled* with the customary practice of belligerents during and following World War II (emphasis added)."[27] The customary practices of belligerents regarding submarine warfare in the Second World War were not in keeping with the London Protocol. Disregard for treaty obligations weakens the treaty.

The Commander's Handbook states that commanders must "take all reasonable precautions ... to keep civilian casualties and damage to the minimum *consistent with mission accomplishment and the security of the force.*"[28] Searching for and collecting the wounded, shipwrecked and sick following an engagement may subject

submarines to undue hazard. The legal requirement for submarines as set forth by the Commander's Handbook is: as "*far as military exigencies permit*, after each engagement all possible measures should be taken without delay to search for and collect the shipwrecked, wounded, and sick and to recover the dead."[29] If military exigencies do not permit such efforts, submarines are required to pass the "location of possible survivors to a surface ship, aircraft or shore facility capable of rendering assistance."[30]

All of the above requirements are imposed on submarines interdicting enemy merchant vessels *unless* one of the following seven requirements is met.

1. The "enemy merchant vessel persistently refuses to stop when" ordered to do so; or
2. It "actively resists visit and search or capture;" or
3. The enemy merchant vessel "is sailing under convoy of enemy warships or enemy military aircraft;" or
4. It "is armed;" or
5. It "is incorporated into, or is assisting in any way the enemy's military intelligence system;" or
6. It "is acting in any capacity as a naval or military auxiliary to an enemy's armed forces" or
7. The "enemy has integrated its merchant shipping into its war-fighting/war sustaining effort and *compliance with the London Protocol of 1936 would, under the circumstances of the specific encounter, subject the submarine to imminent danger or would otherwise preclude mission accomplishment.*"[31]

These first two requirements are not remarkable in that they mirror the language set forth in the London Protocol. The last requirement is the most troubling. It is an exception that swallows the rule. A reasonable interpretation of the last requirement (for the purposes of this paper, "the military exigency exception") would allow submarines to attack enemy merchant vessels without warning and without safeguarding the crews and passengers. The second and third order effects of this rule are daunting.

Unrestricted Submarine Warfare: a Brief Historical Analysis

Submarine attacks are brutal, and thus provoke a response that is disproportionate to the actual damage done by a submarine attack. Time after time, throughout history, despite knowing that the use of submarines to attack enemy merchant shipping would be at best legally questionable, belligerents did so anyway and usually paid a dear price politically.

When the First World War started, Germany at first "fastidiously observed the international rules of engagement."[32] When they encountered enemy merchant shipping, they removed the passengers and crews of intercepted crafts even though the rules when they were written were intended for surface ships and not submarines.[33] At the onset of the war, both sides focused their submarine efforts not on commerce raiding, but rather on their role as warships to be put into action against other warships. Two factors contributed to Germany's retreat from this position: one, the U-boat had sharp limitations as a warship against the British; and two, merchant shipping constituted the lifeblood of Britain.[34] In October 1914, a first was recorded in history when a German submarine, without warning, fired one torpedo at an unarmed French merchant vessel, the *Amiral Gentaume*, not sinking her, but still causing the loss of over forty passengers.[35]

Despite early intentions to the contrary, the debate in Germany quickly evolved from whether to conduct operations against British shipping to how these operations were going to be accomplished.[36] It was presumed that because there was no accepted international law governing submarines, if submarines engaged in attacks on merchant vessels, they must operate under the rules governing surface ships.[37] The closest thing to such rules during the World War I (WW I) era was the Declaration of London of 1909.[38]

In November, Germany declared that "every enemy merchantman encountered would be sunk and that the navy could not in every case assure the safety of the passengers and crew."[39] Germany's justification was that this measure was in retaliation for the illegal British effort to essentially starve the German people.[40] The U.S. responded sternly to Germany, stating there would be serious consequences if a submarine destroyed an American vessel or killed American citizens.[41] In May, a German U-boat sunk the LUSITANIA, which

Germany considered a valid target as outlined by Germany's November declaration.[42] Over 100 American citizens were killed.[43] Many Americans felt that Germany's adoption of submarine commerce raiding proved the Germans to be ruthless, uncivilized war makers.[44] Sinking unarmed merchant ships without challenge or any means of saving the crew and passengers went beyond the pale and put the issue of unrestricted submarine warfare "back into the political arena."[45]

American outrage at the sinking of the LUSITANIA caused Germany to operate under more restrictive rules of engagement through the rest of 1915 and all of 1916.[46] These restrictions seemed impossible to achieve and required submarine commanders to ascertain whether a target was neutral, enemy, merchant, or passenger—armed or unarmed—before firing a torpedo.[47] These carefully calibrated rules revealed the policy and legal sensitivities inherent in the interdiction of merchant vessels. This policy was abandoned in February 1917[48] which eventually caused the United States to sever relations with Germany. One month later, four U.S. merchant ships were sunk, with about 15 killed. America had had enough; President Wilson called for a congressional declaration of war against Germany.

As a testament to the disproportionate power that submarines have on policy makers, "a handful of U-boats, craft that had received little attention just three years earlier at the outbreak of hostilities, had performed what amounted to an unintentional miracle, the greatest political feat of the war."[49] As one author put it, "Germany's decision to employ U-boats as commerce raiders must rank as the most important event in the First World War—by far."[50] That decision "ended once and for all the distinction between combatant and civilian" in "warfare between civilized states."[51] Germany's policy of attempting to bring down Britain by destroying her industrial capacity via unrestricted submarine warfare "came within a whisker of success, but in the end proved ruinous to the German cause because it was instrumental in bringing the United States into the war on the Allied side."[52]

After the war Britain pressed for a total ban on submarines,[53] while the rest of the great powers sought to provide a legal framework for submarine warfare. In the 1930's the London Protocol was

negotiated among all the major powers including Britain, German and the U.S.[54] In short, the London Protocol required submarines to act within the same rules as surface warships. Just as submarine warfare had inadvertently changed the course of WW I, the first submarine sinking of a merchant vessel in WW II was a mistake. Hitler had decreed that submarines would conduct themselves in accordance with the London Protocol: "no U-boat should attack any merchant ship without first challenging her and making sure that her passengers and crew" were safe.[55] Yet on 3 September 1939—the date Britain declared war on Germany—a German submarine sunk a large British passenger liner, the ATHENIA, without warning, but did not report the sinking to higher headquarters because of Hitler's earlier decree.[56] Though Germany denied responsibility for the sinking, they did so in all honesty because the submarine commander still had not reported the incident out of fear of Hitler. Hitler re-emphasized his intention to his navy. He issued an order that "on no account are operations to be carried out against passenger steamers, even when under escort."[57] The poor results from this period of submarine warfare "confirmed what was known from the First World War: submarines make little impression on commerce unless they are employed with a ruthless disregard for the accepted rules of warfare."[58]

Although Hitler had forbidden unrestricted submarine warfare on merchant shipping at the outset of hostilities, Admiral Karl Doenitz, Germany's chief naval officer, knew that Germany would have to resort to such a policy in order to win the war, treaty obligations aside.[59] Doenitz recalled, "One after the other the restrictions came off."[60] At one point, Doenitz ordered that "all attempts to rescue the crews of sunken ships will cease...."[61] The justifications for such orders were numerous: reprisal to a foe's unlawful wartime acts; necessary because merchant ships were armed and dangerous to submarines; and the general integration of merchant shipping into an enemy's war fighting capabilities.[62] As soon as America and Germany had declared war on one another, German submarines quickly produced unprecedented success against U.S. merchant vessels.[63]

In the Pacific, America pushed its treaty obligations aside immediately. On 7 December, still reeling from the shock of the

attacks on Pearl Harbor, American submarines received a message from the Chief of Naval Operations, Admiral Stark: "execute unrestricted submarine warfare against Japan."[64] There was no debate, no hesitation, and no great concern from the national leadership about this policy. Germany had attempted to limit unrestricted submarine warfare. Unrestricted submarine warfare had forced President Wilson, a reluctant warrior, to enter WW I. Yet in 1941 within hours of attack, the United States had a policy of unrestricted submarine warfare, in violation of its London Protocol obligations. Why was this an easy step for the United States to take?

During the interwar period, the U.S. Navy had seen Japan as a potential foe[65] and American submariners saw their purpose as "to scout for the enemy battle fleet and to attack the enemy's capital ships."[66] Yet the decision to order unrestricted submarine warfare did not come as a surprise,[67] despite the United States' treaty obligations and despite the notion that such tactics were scorned by most naval officers who were taught, as Mahan preached, that *commerce raiding* was "the tool of the weaker power in a conflict."[68] Everybody understood "that a directive for unrestricted submarine warfare could be expected within the first week after the outbreak of hostilities."[69]

Conclusions

There are several legal conclusions this paper draws. The United States has adopted a liberal interpretation of "military objective" under customary international law. That interpretation represents an expansive view of the law and is one that is specifically *not* shared with most of the rest of the countries in the world including most of our allies. The United States is practically alone in this view of the governing law.

Enemy merchant ships fall within the definition of *military objective* under this broad interpretation of customary international law. Assuming that enemy merchant ships are considered military objectives, the rule of proportionality still applies when interdicting enemy merchant shipping.

Although not allowed under the London Protocol, the Commander's Handbook permits taking survival of one's own forces' into consideration in the interdiction of enemy merchant

shipping by submarines. In other words, if military exigencies do not permit, submarines are not required to safeguard the crews of enemy merchant ships before an attack, according to the Commander's Handbook. Specifically, if the enemy has integrated its merchant shipping into its war-fighting and war sustaining effort and compliance with the London Protocol would, under the circumstances of the specific encounter, subject the submarine to imminent danger or would otherwise preclude mission accomplishment, then a submarine may attack Chinese merchant shipping without warning and without providing for the safety of its crews. This *military exigency exception* to the London Protocol is an exception that swallows the rule. By way of analogy, imagine if U.S. ground forces were taught that they must obey the laws of land warfare, except if compliance would preclude mission accomplishment. Such illogic would eviscerate the rules.

We can reach at least two conclusions based on a brief analysis of submarine warfare during the First World War. First, unrestricted submarine warfare was so lethal that no nation whose existence depended on overseas trade could be counted on to refrain from unrestricted submarine warfare. Germany nearly succeeded in bringing down Britain by destroying her ability to conduct overseas commerce. Second, unrestricted submarine warfare had powerful and disproportionate political ramifications. Germany's sinking of unarmed merchant ships without challenge or any means of saving the crew and passengers went beyond the pale in the opinion of the international community and caused the U.S. to enter the war against Germany.

A brief historical analysis of World War II also provides several insights. When Hitler decreed that no German U-boat should attack any merchant ship without first challenging her and making sure that her passengers and crew were safe, he essentially eviscerated the submarines' ability to remain undetected. As a direct result, their effectiveness decreased dramatically. As these restrictions were lifted one by one, German submarines became more effective. On the other hand, American submarines in the Pacific in World War II demonstrated just how effective submarines could be if they operated under *unrestricted* rules of engagement. It is likely that a future JTF Commander will therefore see the need to operate his

submarines in a manner in which they remain undetected in order to maximize their effectiveness.

Another insight from a historical perspective is that in order to be effective, submarines must remain undetected. This means they cannot issue warnings and provide for the safety of the crews prior to firing a torpedo. In the Second World War the belligerents believed that it was inevitable that restrictions on submarine warfare would fall as the belligerents attempted to counter each others' unlawful wartime acts or respond to a military exigency. The practices of belligerents with regard to submarine warfare in the Second World War were not in accord with the London Protocol.

Finally, this paper offers three points for consideration to the future JTF Commander faced with the possibility of waging unrestricted submarine warfare against Chinese merchant shipping. A policy of unrestricted submarine warfare against enemy merchant vessels must come from the National Command Authority. Attacks may even be planned and approved at the strategic level in order to achieve strategic objectives. A JTF Commander may have little advance notice. As we saw during World War II, the order to *Execute unrestricted submarine warfare* came down from Washington, D.C. within six hours of the surprise attacks on Pearl Harbor. A JTF Commander must therefore be prepared to provide input on this issue to his higher operational commanders and the strategic commanders at a moment's notice.

Additionally, a JTF Commander must understand the legal parameters in which he or she operates. This paper delineates some of those legal parameters. Unarmed enemy merchant vessels will be seen as proper military objectives by a JTF Commander in the future under a reasonable interpretation of the rules set forth in the Commander's Handbook. The JTF Commander must realize though, that the Commander's Handbook provides an expansive interpretation of military objective under international law. It is one that the U.S. has adopted, but one that most of the other nations of the world have rejected. The U.S. is one of the few holdouts in this regard.

Finally, sinking unarmed merchant ships without warning or any means of saving the crew and passengers will be viewed internationally as beyond the pale. The international community will see such action as outside of the rules set forth by customary international

law. After all, the U.S. interpretation of the requirements of international law is diametrically opposed to that of most of the rest of the global community. Before a future JTF Commander invokes the *military exigency exception* to compliance with the London Protocol in order to rationalize why his submarines were required to attack without first safeguarding the crews and passengers of unarmed enemy merchant vessels, he should carefully consider the damage such operations will do to the legitimacy of the overall operation. The courses of action the JTF Commander considers must be acceptable.

Accordingly, the legitimacy of an operation is at risk if the operation relies on a legal position that is not shared by most of the rest of the world. Domestic and international legitimacy is crucial to the success of an operation. Legitimacy concerns require that our operations "foster, sustain and communicate the legal, moral, and just nature of the operation and actions of the U.S. Government...."[64] Unfortunately, this broad interpretation of international law, if operationalized, would be counterproductive to U.S. efforts because it would diminish the legitimacy of U.S. efforts. Courses of action that are not characterized by *legitimacy* are not acceptable.

Admiral Doenitz's words ring true today: Germany "adhered to the provisions of international law contained in the London agreement and that it was only step by step, in response to breaches of these provisions by the enemy that we allowed ourselves more and more latitude until finally we reached the stage as, it was inevitable that we would, where the London agreement was abandoned completely and for good."[65] The Commander's Handbook provides exceptions to the London Protocol that threaten to swallow the rule and, if followed, endanger the legitimacy of future U.S. actions internationally.

As noted by Mahan at the start of this paper, "The submarine has the smallest value of any naval vessel for the direct attack upon trade" because "she cannot remove passengers and other persons if she wishes to sink one."[66] Since a submarine cannot effectively attack enemy merchant vessels while complying with the London Protocol, Mahan rightly saw this method and means of warfare as beyond the pale, and one that would severely jeopardize the legitimacy of the cause.■

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ENDNOTES

1. Alfred Thayer Mahan, *The Influence of Sea Power upon History, 1660-1783*, (Boston: 1890), 539. Hereinafter, "Mahan."
2. This paper defines enemy merchant shipping as those ships that are PRC-flagged.
3. This island is just off the coast of the PRC, but owned by Taiwan.
4. This too is an island just off the coast of the PRC, owned by Taiwan.
5. This paper assumes that a state of international armed conflict exists between the PRC and the U.S. The issues of attacks against PRC military vessels or neutral vessel shipping are beyond the scope of this paper. Attacking enemy military vessels is not a matter that is in any doubt. According to the Commander's Handbook on the Law of Naval Warfare (hereinafter, "Commander's Handbook"), "Proper targets for naval attack include such military objectives as enemy warships...." The Commander's Handbook on the Law of Naval Operations, NWP 1-14M, MCWP 5-2.1 COMDTPUB P5800.7, 402, 1995, reprinted in its annotated version as vol 73 of the US Naval War College International Law Studies (1999). It further states at page 419, "Submarines may employ their conventional weapon systems to attack enemy surface, subsurface or airborne targets wherever located beyond neutral territory ... Enemy warships ... may be attacked and destroyed without warning.
6. Michael Schmitt, "*Fault Lines in the Law of Attack*," in Susan Breau & Agnieszka Jachec-Neale eds., London, British Institute of International and Comparative Law, 2006, 277. Hereinafter, "Schmitt."
7. Commander's Handbook, para 8-4.
8. Protocol Additional (I) to the Geneva Convention of 12 Aug 1949, and Relating to the Protection of Victims of International Conflicts (12 Dec 1977), hereinafter, "API." Art 48.
9. API Art 48.
10 Commander's Handbook, 404.
11. API Art 48.
12. API Art 51.
13. API Art 52.

14. Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 Aug 1949. Hereinafter, "Commentaries." Para 2016.
15. Commentaries, para 2020. This category comprises all objects directly used by the armed forces: weapons, equipment, transports, etc.
16. Commentaries, para 2021. For example, a bridge.
17. Commentaries, para 2022. The criterion of 'purpose' is concerned with the intended future use of an object, while that of 'use' is concerned with its present function.
18. Commentaries, para 2022. Most civilian objects can become useful objects to the armed forces. Thus, for example, a school or a hotel is a civilian object, but if they are used to accommodate troops or headquarters staff, they become military objectives. It is clear from [a previous paragraph] that in case of doubt, such places must be presumed to serve civilian purposes.
19. API, Art 52.
20. Commander's Handbook, para 8.1.1. Emphasis added.
21. Commander's Handbook, 403.
22. *Ibid*, 403.
23. Commentaries, para 2028.
24. Commander's Handbook 404. This rule originates from API Article 51, which lays out the proportionality test: a planned attack may not be considered proportionate if it is "an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated." (Art 51, b).
25. Schmitt, 296.
26. Commander's Handbook, 420.
27. Commander's Handbook, 420.
28. *Ibid*, 405. Emphasis added.
29. *Ibid*, 408. Emphasis added.
30. *Ibid*, 419.
31. *Ibid*, 421. At page 412, the Commander Handbook notes that "war sustaining" is imprecisely defined, but that "effort" that "indirectly but effectively supports and sustains the belligerents war-fighting capability properly falls within the scope of the term."
32. Thomas Parrish, *The Submarine*, (New York 2004), 67. Hereinafter, "Parrish."
33. *Ibid*, 57. On 5 September 1914 Kapitanleutnant Otto Hersing, Commander of Imperial German Navy submarine, *U-21*, sighted and sunk the British warship, PATHFINDER, thus becoming history's first sinking ever by a submarine acting a true undersea craft.
34. *Ibid*, 71.
35. *Ibid*, 68.
36. *Ibid*, 71.
37. *Ibid*, 72.
38. *Ibid*, 73. But this agreement did not come into effect because Britain (among other countries) did not ratify the treaty. The U.S. asked the warring parties if they intended to follow the London Declaration. Britain responded vaguely, but their policy was "to secure the maximum blockade that could be enforced without rupture with the United States." (Parrish, 77) This was a wise policy and one that will probably govern future rules of engagement regarding submarine warfare against merchant vessels.
39. *Ibid*, 80.
40. Edward Horton, *The Illustrated History of the Submarine*. (Garden City, 1974), 90. Hereinafter, "Horton."
41. Parrish, 81.
42. *Ibid*, 93.
43. Horton 95.
44. Parrish, 103.

45. Horton 95.
46. *Ibid*, 95. By September, the new chief of the German naval staff ordered a complete suspension of all submarine activities on the west coast of England and to carry out operations elsewhere in accordance with the Prize order, which in essence placed submarines under the same rules governing surface ships. (Parrish, 104).
47. Parrish, 106.
48. John Hervey, *Submarines*. (New York, 1994), 3. Hereinafter, "Hervey."
49. Parrish, 138.
50. Horton 86. At page 161, Horton states: By war's end, German submarines had sunk 5,708 ships, totaling over 11 million tons, representing one-fourth of all the world's shipping.
51. *Ibid*, 86.
52. *Ibid*, 72.
53. *Ibid*, 106.
54. Parrish, 177.
55. *Ibid*, 201.
56. *Ibid*, 201
57. *Ibid*, 201. Hitler's order actually went beyond what the London Protocol required, as escorted civilian vessels were unprotected under the agreement.
58. Horton 116.
59. Parrish, 319.
60. Horton 118.
61. Karl Doenitz, *Memoirs: Ten and Twenty Days*. (New York, 1959), 263. Hereinafter, "Doenitz".
62. Commander's Handbook, 410 and 420.
63. These were heavily concentrated, operating without convoys and escort ships, and unconcerned about the dangers they faced. (Horton, 125). Of the over 200 Atlantic convoys, German submarines sunk 2,779 merchant ships, and over 14 million tons. (Horton, 295). German submarines had "a field day." (Horton, 125).
64. Parrish, 319.
65. *Ibid*, 318.
66. Thomas E. Griess, *The Second World War*. (Avery, 1984), 115.
67. Parrish, 320.
68. Ibid, 319.
69. *Ibid*, 320. The Americans were quite successful. In December 1941, Japan's merchant shipping consisted of over six million tons; by August of 1945, it was 1.47 million tons. (Merrill, 101) "American submarines had virtually made it impossible for Japan to fight anywhere in the Pacific outside her own islands." (Hervey, 3) "For the first time in world history a nation was brought to its knees by an assault on its commerce..." (Horton, 147).
70. Joint Staff, *An Evolving Joint Perspective: US Joint Warfare and Crisis Resolution in the 21st Century*, 28 January 2003, 55. This was reprinted as NWC 2029.
71. Doenitz, 59.
72. Mahan, 539.

THE U-966 STORY: AGAINST ALL ODDS

by Lieutenant Colonel Buck Cummings, USMC (Ret.)

Buck Cummings is a retired Marine Corps Lieutenant Colonel. He has been a military and commercial pilot for 44 years and flew the A-4 Skyhawk, AV-8 Harrier, and other types of jet and prop aircraft. He flew 87 missions in Vietnam combat but admits his real interest is in writing living history from World War II, as told by the veterans themselves. Buck lives in Norfolk, Virginia with his wife Sharon and has two grown daughters.

The record of the U.S. Navy's aviation force in the Pacific in World War II is voluminous and well-documented, while the Navy's aviation effort in the European side of the global conflict is much less heralded. It became, in its last and most effective stage, an intense fight over a two-year period against the German U-boats, using Very Long Range (VLR) B-24 aircraft, designated PB4Y-1's, operating from southern England over the Bay of Biscay. In 1940, the fall of France had allowed the German Navy to gain use of the ports of western France for their highly effective war against Atlantic shipping bound for England. Continuous patrols by Allied aircraft, many of them U.S. Navy patrol aircraft of Fleet Air Wing 7, kept the U-boat on the defensive from early 1943 on, and destroyed many of them. As I studied the intriguing aspects of this U.S. Naval Aviation effort, knowing that my father had served with Fleet Air Wing 7 in 1943 and 1944, this entry in his war diary, of a desperate battle long ago in the Bay of Biscay, caught my attention:

"10 November 1943/Time 0910/U-boat near Cape Ferrol, Spain under attack by Liberators from VB-103, VB-105, and VB-110. Flak from U-boat intense. One Liberator hit and returning to Dunkeswell air base with one engine out. U-boat remaining on surface and fighting back."

I had found my father's diary, lost for years under a bookcase in our summer cottage in New Hampshire. As Senior Air Combat Intelligence Officer (ACI) for Fleet Air Wing 7 in Plymouth, England, he had kept detailed records in this diary. There were entries about German Ju-88 fighter attacks against the U.S. Navy PB4Y-1's in the Bay of Biscay and the western approaches to France and England in late 1943 and 1944. There were many mundane entries also about the common wartime problems of poor flying weather and mud that bogged down the planes on the southern England airfields. The U.S. Navy's Fleet Air Wing 7, attached for patrol operations to the 19th Group of the Royal Air Force, Coastal Command, was doing its best to cope with the frustrating and dangerous conditions presented to it by the elements, the British, and the Germans—all at the same time.

The diary entries of 10 November 1943 made it clear that this particular U-boat wasn't dying in the usual way. If they were caught at all, the U-boats usually went down with all their crew and left little evidence on the surface that brave men had fought and lost the final battle in their young lives. There were many entries in my father's diary also about the losses of Navy aircraft, to weather, enemy fighters, fuel exhaustion, and engagements with the U-boats, which had a surprisingly effective anti-aircraft defensive armament arrays by that time in the war. The diary entry of 10 November indicated that this battle took place over nine hours with seven different aircraft—three U.S. Navy and two Royal Air Force PB4Y-1 Liberators, one Wellington bomber, and one Sunderland flying boat. All the returning U.S. Navy Liberator crews reported "U-boat still on the surface, fighting back." Not one crew claimed a definite kill. Their depth charges dropped close to, but didn't kill, a U-boat that was evidently maneuvering hard and shooting back with everything it had. Aircraft were returning to their bases with damage to engines and airframes. The last aircraft to see the U-boat, a British Sunderland flying boat from 228 Squadron, reported it to be approaching Spanish territorial waters near Cape Ferrol, Spain. Just after sending this message back to Coastal Command, the Sunderland made two low passes over the damaged U-boat and dropped a life raft but was shot down by three Ju-88 fighters. This German aerial victory was witnessed by the struggling survivors who

were swimming for their own lives to the rocky shoreline about 300 yards from where the U-boat had grounded on a reef. It was damaged extensively from the long fight but was still afloat as the crewmen jumped into the frigid water for their desperate swim. The survivors took little joy in watching this crash of the Sunderland, which had passed over them in a non-aggressive way and appeared to be investigating the U-boat's condition. The crashing surf, oil ingestion, and exposure were taking a heavy toll on the German crewmen but they had fought ferociously on the surface and had apparently all but escaped the sting of the potent aircraft arsenal arrayed against it.

As I continued to read the diary I came to an entry of 15 November 1943 which jumped off the yellowed page:

> *"From Headquarters 19 Group: It is now known that the U-boat attacked on 10 November by five Liberators of VB-103, 105, 110, and 612 and 311 Squadrons sank off Punta De La Estaca, Spain. 39 unwounded, 3 wounded, and 3 dead of the crew got ashore."*

What U-boat was this that had fought so gallantly? Might some veterans of it still be found alive in Germany in 1996? U-boat sailors were young men, like the crews of the Liberators who hunted them. I supposed that a good number of this German fighting crew of 1943 would still be alive and eager to talk about their struggle to survive. A search at the Armed Forces Staff College library in Norfolk found the definitive German U-boat history of the Second World War, German Naval History: The U-Boat War in the Atlantic, 1939-45. It confirmed that the U-boat in question was U-966, a Type VIIC Atlantic Class submarine of 712-ton displacement. German records also confirmed a near match on their casualties with the British Admiralty figures—42 survivors, three of these wounded, and 8 dead.

An exchange of letters with the founder and curator of the U-boat Archive in Cuxhaven, Germany followed in the months after my discovery. Horst Bredow, the meticulous caretaker of German U-boat histories and memorabilia kept at the U-boat Archive, became an enthusiastic help and put me in touch with Herbert Korner, the reunion coordinator for U-966 and its wartime chief engineer

onboard at the time of the battle. Shortly after my introductory letter to Korner I received an invitation to attend the 21st annual reunion of the U-966 crew in Dresden-Pirna, Germany, on the Elbe River. In the years that have followed my first reunion with the surviving veterans of U-966 I have attended three more of their reunions. My hope is that this summary of their story will do justice to the gallantry of the men who served on both sides of this naval battle.

U-966 was launched at Kiel, Germany in March, 1943. The newly designated commander, Oberleutnant Ekkehard Wolf, was not yet 25 years old, but already he was a veteran with experience on two previous U-boats. The crew gradually came up to a full strength of 50 men and the boat cruised initially for training in the Baltic Sea and then north into Norwegian waters. Wolf drove his men hard in countless diving and torpedo attack drills, often telling them, "at this rate you will never be the sailors you can be—maybe lumber for bowling pins, but not good sailors!" This cry of the Commander inspired the creation of the U-966 emblem: a ball knocking down a wooden bowling pin and the words "Gut Holz" (*Good Timber*).

The crewmen rose to Wolf's challenge and loved him all the more for his drive and determination. They knew his pressure in training would be the key to survival on the unforgiving Atlantic patrols. Wolf cared deeply for his crew, frequently taking men aside and asking about their families and helping in small ways to dispel the stress and apprehension of their circumstances. This affection for Wolf, and for his wife Ali, is a common sentiment expressed even today by the veterans. Wolf was a hard driving but compassionate commander. Like him, the entire crew was young. They ranged in age from 18 to 30 years old, with the majority being between 19-22. The oldest man in the crew, Karl Grauthe, who would celebrate his 30th birthday in August, 1943, had already survived 7 Atlantic patrols on two other U-boats, a career that had already beaten the survival odds by a wide margin. The crew was a close-knit group. There was no privacy in the cramped U-boat and everyone was cross-trained in many critical jobs. They had a special affection, expressed frequently even today at their reunion, for the cook, Helmut Thronicke, age 20, who worked so hard under impossible conditions to make excellent meals for them.

On September 24, 1943 U-966 began its North Atlantic patrol

from Trondheim, Norway. It made the passage through the heavily patrolled Iceland/Faeroe Islands choke point undetected in a heavy storm but was soon thereafter attacked by British destroyers. An emergency dive to 150 meters saved U-966 from the depth charges exploding around and above it. 87 detonations were recorded by the fearful crew during this attack. When U-966 surfaced the destroyers were gone but the crew soon realized that their radio was damaged. There was no capability to transmit messages or respond to inquiries. U-boat Command in Germany apparently gave up the boat as lost after several days of not hearing from it. This was indeed a frustrating and dangerous development. Orders to rendezvous with other boats or to stay clear of dangerous areas or enemy antisubmarine patrols could not be received. U-966 was deaf and blind but it continued its patrol, hoping to somehow fix the problem or run across its prey by sheer luck. After this initial attack the crew fully realized how desperate their patrol would be. The Captain drilled them daily on diving and battle station drills but soon realized the boat urgently needed repairs if it was to survive and be effective later. He ordered "Course toward home!" and made the decision to make best speed for the west coast of France, through the Bay of Biscay, a dangerous killing ground of U-boats. It was the only possible salvation for U-966.

In the early morning of 10 November 1943, just after the U-966 on-deck watch had changed at 4AM, a British Wellington bomber from 612 Squadron, Royal Air Force, detected the boat on the surface, using its high-power Leigh Light illumination. The bomber's pilot in command, Warrant Officer I.D. Gunn, soon realized that the bright moon and phosphorescent wake created by the U-boat made it possible to begin his attack run with the light turned off, making him less of a target to the now alerted deck gunners. The first indication of the attack to most of the U-boat crew was the exploding depth charges. The detonations were heard and felt by everyone. Years later Herbert Korner wrote of the attack that day. *"It was as if an invisible hand grabbed and shook the boat. Complete darkness came over us and in a moment the emergency lights came on. There was total chaos! Everything not tied down went flying and broken glass was everywhere."* The boat's antiaircraft guns began firing rapidly and soon there was evidence, from smoke and electrical

odor, that the right side electrical engines were shorting out. Two men on deck had been wounded in the gunfire exchange and as soon as they were brought inside, the Captain ordered an emergency dive to 150 meters.

None of the crew's training had prepared them for the hellish conditions that now prevailed onboard. The boat was making strange noises, like a wounded and desperate animal. There were no comforting or familiar smells or sounds of smoothly running machinery or warm glows of lights where they should be. Few of the pressures and temperatures were in normal ranges. There was disorder, noise, and wrong readings on many critical gauges. Fear was an emotion shared by every one, but still the crew functioned as it had been trained to do. This was not the U-boat they knew so well! It would not level in its dive and continued to 200, then 220, then 240 meters before it stabilized. The left main engine bearing began to overheat and the situation became extremely dangerous. Some small comfort came to the crew when the boat began to respond to commands and held together far below its certified depth of 180 meters. Purposeful work to clean up shattered debris and survey what still worked began to put hopeful faces on the men. At 9AM, after nearly 5 hours under water and low on battery power, U-966 surfaced in bright sunlight and fair seas. This fair scene was a very dangerous place and the Captain of the U-966 knew that any U-boat on the surface could expect detection and rough handling there within minutes from the ubiquitous long-range patrol planes. Today would be no exception. Within 30 minutes of breaking the surface, U-966 was again under attack from the air.

Lieutenant Leonard Harmon of the U.S. Navy's VB-105 squadron found U-966 on the surface in the extreme southwest corner of his patrol sector. He had just made the decision to begin his inward patrol track back to the Dunkeswell air base. He maneuvered his PB4Y-1 Liberator to attack the U-boat out of the sun but heavy anti-aircraft fire from the U-boat damaged the depth charge release doors and the heavy bombs would not drop. He made two strafing runs on the surfaced U-boat and turned back toward base with damage to the airplane. As he departed the scene he called in other aircraft which soon arrived to continue the fight. At 1140AM Lieutenant Ken Wright from VB-103 squadron made radar contact with the U-boat

and attacked shortly thereafter. He dropped five depth charges and one homing torpedo in two attacks on U-966, causing some damage to the U-boat. Harmon reported the U-boat to be firing and maneuvering in a highly effective manner.

The U-966 crewmen wrote in later years that they fired almost 12,000 rounds of 20 and 37 millimeter antiaircraft ammunition that day. This fire was definitely getting the respect of the attacking aircraft. In one instance the gunfire destroyed an engine on one aircraft and blew out the Captain's side window on another. The aircraft crews reported the U-boat would quickly maneuver to face each diving airplane and thereby present the narrowest frontal aspect possible to its attacker. The intense gun tasks on the U-boat took its toll also. One of the overheated guns on the 20-millimeter mount blew up from overheating and struck down the gunner with a mortal head wound. He was quickly replaced on the guns and the firing continued. This was combat seamanship at its finest, but the odds were starting to become overwhelming against U-966.

By 1PM U-966 had been under intervals of attack for about 7 hours. The crew was as alert as ever and fighting back with every skill and bit of energy they had left. The previous airplanes had been quick to radio exact position reports and each one departing was relieved on the scene by a fresh attacker. Lieutenant William Parish, piloting a Liberator from VB-110 squadron, arrived at about this time and delivered his six depth charges close to the U-boat, inflicting some undetermined damage that slowed the boat's speed by about 4 knots and caused it to begin leaving a trail of light oil.

Making its erratic course toward the Spanish coast, U-966 was now about 10 miles from the rocky shoreline. Crewmen later wrote about seeing white homes with red tile roofs and a tall church on the cliffs overlooking the sea. It was a vision of hope and salvation. Shortly after Lieutenant Parish delivered his attack, a white Liberator from the Free Czech 311 Squadron, piloted by Flight Sergeant Zanta, arrived and pressed home two attack runs with rockets. The second on these runs did some damage to U-966. It was about this time that U-966, now very close to the shoreline, struck a submerged reef. Since the U-boat was now inside Spanish territorial waters, the circling aircraft stayed off at a safe distance. Captain Wolf, who some time earlier had given the order to burn all secret documents

and prepare to abandon ship, now gave his crew the actual order to leave the boat and scuttle it.

It was 2PM and U-966 had been under attack for over nine hours in the furious fight for its life. Life rafts were deployed but were soon whipped away in the rising wind and pounding surf. Without the life rafts, each man made the decision to swim for the shore about 300 yards away. Eight out of the fifty crewmen did not make it and drowned in the surf or were pounded unconscious by the crashing waves. Of the eight who died, five were recovered to the shore and later buried in a nearby cemetery. One of these dead was the oldest crewman onboard, 30 year old Karl Grauthe. As the crew was abandoning their boat, a British Sunderland flying boat arrived on the scene to report, and also film, the action. Some of the surviving crewmen of U-966 later recalled that the Sunderland aircraft flew over the U-boat and dropped a life raft nearby. This aircraft, from 228 Squadron, Royal Air Force, was piloted by Flying Officer Arthur Franklin and had eleven other men in the crew. Three German Ju-88 fighters arrived on the scene about this time and shot the Sunderland down, in full view of the struggling U-966 crewmen. All on the Sunderland were killed as it crashed in flames and continued to burn on the water for ten minutes or more. Only six of the dead crew were found by Spanish fishermen and returned to England.

As the crewmen were swimming toward shore some of them took grim satisfaction when the onboard demolition devices exploded on their sinking U-boat. It isn't clear today if it was the onboard charges kept for the purpose of self destruction or a depth charge that had been dropped earlier by an attacking airplane. That depth charge had become lodged in the outer hull vent ports. Depth charges were not supposed to hit their targets. They were designed to be dropped near the target and explode so close that hydraulic pressure from the underwater blast would crush the hull. Preset to detonate at a 35 foot depth, this deadly parasite had remained dormant but still attached, waiting for the boat's next dive. U-966 had fought on the surface all day and only now, in a death ritual administered by its own crew, did it slip below 35 feet.

Spanish fishermen and local citizens had been watching the battle for some time and now came to the aid of the struggling survivors.

Two fishing boats from Kap de Bares soon arrived and began rescuing the crew as well as the bodies from the crashed Sunderland. The arrival of the German Navy combatants in Spain caused great excitement and they were given food and clothing by the local inhabitants. They were soon bused to El Ferrol where they were initially put up in hotels while negotiations continued regarding their status.

Under the rules of the Geneva Convention a judgment of *Shipwrecked* could have given the crewmen passage back to Germany immediately. The other possibility was designation as *Combat Casualty*, which meant internment in the neutral country in which refuge had been found. On 12 December 1943 the Spanish foreign ministry ruled that A—*Combat Casualty* was the status of the U-966 crewmen and they were sent to an interment camp at La Grana. While the crew was awaiting the ruling on their status they had heard British radio read the names of 32 of the crew. They realized that the names of ten survivors among them had not been read. In the middle of the same night that the British radio announcement was heard, five of the crewmen whose names had not been read were put into cars and driven quickly to the French border. The second group of five, to which Heinz Maslock belonged, were picked up on 15 December 1943 by the German consul, declared *Shipwrecked*, and sent with new passports to Brest, France. Heinz Maslock was subsequently assigned to duty on two other U-boats, U-1277 and U-3504. When the war finally ended he wrote, "I didn't know what the future would bring or how things would continue, but I was alive!" Three other crewmen who left Spain with Heinz Maslock would die in other U-boats before the end of the war. Fritz-Dietrich Adenstedt would go down with U-709 on 1 March 1944 and Hans Auerbach and Wilhelm Schnier would die when U-1055 was sunk on 30 April 1945, only 8 days before the end of the war. These men were the last combat casualties from the original crew of U-966.

For the remainder of the group interned in Spain life seemed to be pleasant and their strong memories of that time continue to this day. The crew of another interned U-boat, U-760, was also at the same camp and together they held track and field meets and received periodic visits from the German attache in Madrid. An allowance of 240 pesetas a month to each man from the Spanish Consulate, in

addition to their normal pay sent from Germany, made life relatively rich for the interned crewmen. At their reunion in May in Pirna, surviving crewmen told me happily that Spanish wine was 2 pesetas a liter and the *finest cognac* was only 6 pesetas a liter. This fact of life, combined with nightly permission to visit the local town unsupervised until the 10PM curfew and spend their available money, was a formula that formed close bonds of friendship which is still evident today at the reunions.

In 1974, Herbert Korner was on vacation in Spain and decided at the last moment to visit the area near where he had spent almost two years of his young life as an interned crewman. Asking the local people if they remembered a wrecked German U-boat, he found that many of them did recall that event. They also told him that another German gentleman was there at a local hotel asking the same questions. Herbert Korner went quickly to the hotel where he found, to his delight and total surprise, his old Commander Ekkehard Wolf. On that night, plans were made for the U-966 reunions, which began in 1975 and have continued every year since.

Captain Wolf died on 26 March 1978. Following his wishes, his ashes were dropped over the wreck of U-966. The rusting tower of U-966 can still be seen at low tide during rare moments of tranquil sea states off the rocky northwest coast of Spain. The few surviving veterans of U-966 often visit the wreck, a silent tribute to the brave men on both sides who fought on that bright November day 64 years ago.■

THE MANDATES AND THEIR SIGNIFICANCE IN WWII

by Mr. Don Messner

Mr. Messner served in DIODON in the fifties. He stays in touch as a Life Member of both the Naval Submarine League and US Sub Vets, Inc. He is an associate member of WWII Sub Vets.

Several years ago my interest was kindled about the history of submarine operations in WWII. After many years of gathering dust on my bookshelf, I reread Theodore Roscoe's Submarine Operations in WWII and Clay Blair's Silent Victory, together considered *the* two best reference books documenting submarine operations in WWII. This was just the tip of the iceberg, and since then I have devoured every credible book I could find about the subject, but the subject expanded to include not just submarine operations but also surface operations, major battles and even the intelligence aspect—over 100 to date.

Becoming familiar with all the names of the atolls, islands, archipelagos, bays and seas found in the Pacific and then locating them on a map was indeed a challenge. For me, this was a necessity as a map is worth a thousand words and their location would give me a better understanding of the strategic significance of the naval operations and engagements. Modern atlases are of limited help because of many name changes created by newly found independence of many of the islands. So, with the help of a couple of 1945 edition atlases purchased thru the internet, and using a couple of internet search engines, I located most everything. Everything, that is, except those elusive islands referred to as the Mandates.

I knew the Mandates must have some strategic importance because too many authors alluded to them in that manner yet none defined what constituted the Mandates. I found the Gilberts, Marshalls, Solomons, Philippines, Marianas, Timor, Morotai, New Caledonia, Espíritu Santo (New Hebrides), Bismarck Archipelago, Carolines, Bonins and even French Frigate Shoal, but the Mandates were elusive. They were not in any atlas' index and not to be found anywhere in the Central or South Pacific.

Back to the internet and more research. With patience and perseverance, I discovered that the Mandates were not an independent group of islands or atolls but actually consisted of three separate groups of islands; the Marshalls, Carolines and Marianas (less Guam). Further, they were under Japanese control prior to WWII - since 1920 to be exact.

The major atolls of the Marshalls consisted of Majuro (future US advanced sub base), Eniwetok, Bikini, Jaluit, Wotje and Kwajalein. The Carolines included Truk (a major Japanese naval base), Ponape, Woleai, Ulithi and Yap. The Marianas included Tinian (future US B-29 base), Saipan and Rota.

Now, the significance of the Mandates starts to become apparent. But one question still remains—how did Japan get control over these island in 1920? To get that answer, one has to go back in history prior to the Spanish-American War of 1898.

Marshalls

In 1885, Germany tried with little success to establish a colony in the Marshalls but in the process laid claim to them. During WWI, as Japan had declared war on Germany, Japan seized the islands and began to occupy them.

Carolines

After the Spanish defeat in the Spanish-American War, Spain ceded their interest in the Philippines to the US and sold their interest in the Carolines to Germany. Again Japan took the opportunity during WWI to seize the Carolines and began to occupy them.

Marianas

Similarly, after the Spanish-American War, Spain ceded the southern part of the Marianas to the US (basically Guam) and sold the northern half to Germany. Immediately upon declaration of war with Germany in August of 1914, Japan proceeded to land troops and occupy the island of Saipan.

Now enter the League of Nations to *divy* up the spoils of war after the WWI truce. Because of Japan's actions against Germany, the League essentially acknowledged these actions and *mandated* administrative control of the Marshalls, Carolines and the northern Marianas to Japan—hence the name Mandates. This happened in 1920.

At this time Guam and Wake Island were US territories and the Gilberts were British colonys. The Gilberts lay southeast of the Marshalls and included the atolls of Tarawa and Makin (a Japanese seaplane base in WWII) but were not part of the Mandates. All of these island groups collectively were known as the Greater Micronesia Islands and were part of Japan's Greater East Asia Co-prosperity Sphere (the Japanese did invade and occupy the Gilberts 3 days after the attack on Pearl Harbor).

One can now begin to appreciate the significance of the Mandates in WWII. First, with Japan in control of all this territory in the mid Pacific, it's understandable why the US's political and military leaders anticipated any attack on Pearl Harbor, if any, would come from the southwest, i.e., the Mandates, specifically the Marshalls, not from the northwest as happened. This made logical sense as the Japanese would use their presence in this area to strategically isolate the Pearl Harbor fleet from coming to the aid of the Philippines where the threat of attack was considered most imminent.

Secondly, one can understand the importance and appreciate the dangers of the ComSubPac war patrols originating in Pearl Harbor and terminating in Australia, ComSubSoWesPac territory, and vice versa as they traversed right thru the middle of these enemy held waters.

The drive to reclaim the Central Pacific and the Mandates started with operation Galvanic in November '43, the invasion of Tarawa and Makin in the Gilberts. This was over a year after the abortive Argonaut (SS-166) - Nautilus (SS-168) / Carson's Raiders Marine commando raid in August '42. The fifteen month delay was largely a function of lack of air support from the US fleet. After the loss of Wasp (CV-7) and Hornet (CV-8) in September and October of '42 in battles of the Solomons, the US had only two operational carriers in the Pacific, SARATOGA (CV-3) and ENTERPRISE (CV-6). Because of enemy inflicted damage, only one carrier was able to be on station in the South Pacific at a time as the other was in Pearl Harbor or Puget Sound shipyard for repairs and upkeep. It wasn't until November '43 that the US fleet could muster up the required *air superiority* support with SARATOGA, and the newly commissioned carriers ESSEX (CV-9), YORKTOWN (CV-10), LEXINGTON (CV-16), BUNKER HILL (CV-17) and PRINCETON

(CVL-23) to commence the march on Tokyo via the Mandates.

According to Clay Blair in Silent Victory twelve submarines participated in operation Galvanic with NAUTILUS playing the most direct role. NAUTILUS did triple duty in that she performed lifeguard duty, reconnaissance duty and landed 78 Marines on Abemama, an atoll just south of Tarawa.

Five additional boats were patrolling to the west of the Gilberts waiting to intercept any Japanese reinforcements sent out from Truk. These included SubPac boats THRESHER (SS-200), APOGON (SS-308) and CORVINA (SS-226) supplemented with SubSoWesPac boats DRUM (SS-228) and BLACKFISH (SS-221).

Three Pearl boats, SEAL (SS-183), PLUNGER (SS-179) and SPEARFISH (SS-190), were patrolling in the Marshals to cut off any reinforcements sailing from Kwajalein, and two other Pearl boats, SEARAVEN (SS-196) and SCULPIN (SS-191), were positioned east of Truk by the islands of Oroluk and Ponape ready to intercept any traffic bound for the Gilberts via Kwajalein. Finally, the twelfth boat, PADDLE (SS-263), was assigned to *weather watch* and was positioned due west of the Gilberts.

The importance of taking the Gilberts as a first stepping stone to occupying and controlling the Mandates is seen in the number of submarines Admiral Lockwood assigned and the number of carriers Admiral Nimitz assigned to Operation Galvanic. The US was successful in its quest for the Gilberts, but the price was high—too high in some military leaders opinions.

Tarawa was by far the most costly. Nearly 1000 2nd Division Marines were killed at Tarawa and over 2000 were wounded. Conversely, almost the total garrison of 4800 Japanese soldiers was killed in the battle with only 17 taken as PoWs. Makin must have been a cake walk in comparison as less than 70 Army personnel from the 27th Infantry Division were lost with an additional 150 wounded. The Marines on Abemama were unopposed.

In addition, the US 5th Fleet assault/amphibious force lost the carrier LISCOMBE BAY (CVE-56) with over 700 lives. Two ComSubPac submarines were also lost. According to Silent Victory, CORVINA, BLACKFISH and DRUM had been alerted by an Ultra message that a Japanese submarine was in the area. Details are not known, but I-176 caught CORVINA on the surface and fired a

spread of torpedoes inflicting mortal damage on her. This was CORVINA's maiden patrol and was the only US sub positively lost to a Japanese sub. (The fate of I-176 was sealed on 16 May '44 when in an ASW action US destroyers HAGGARD (DD-555) and FRANKS (DD-554) destroyed her north of Bougainville in the Solomons).

On 18 November, two days after CORVINA's loss, SCULPIN, after suffering severe damage from a depth charge attack east of Truk, surfaced to *fight it out* with her deck gun. As Clay Blair puts it, " It was a one sided engagement with SCULPIN the loser". With the CO and XO and Gunnery Officer killed on the bridge by mortar fire, the succeeding officer ordered abandon ship. It was here that Captain John Cromwell, riding the boat as wolf-pack commander decided to *ride the boat down*. He knew too much about the pending Gilbert Island invasion as well as the Ultra code and decided against capture. For this action, he was awarded the Medal of Honor posthumously.

Half the crew of SCULPIN perished. The rest (41 men) were picked up by the Japanese and sent to Truk for interrogation. They were soon put on two carriers for transport to Japan. One of the carriers, CHUYO, was sunk by SAILFISH, SS-192 (ex SQUALUS) on 4 Dec. The irony is that it was SCULPIN which had stood by and assisted in rescuing the crew of the SQUALUS in 1939. (The other carrier, UNYO, was later sunk by BARB, SS-220 - sans prisoners.)

Operation Galvanic was the initial thrust in reclaiming the Gilberts and gaining control of the Mandates. Operation Flintlock (invasion of Kwajalein and Majuro), Operation Hailstone (bombing of Truk) and Operation Catchpole (invasion of Eniwetok) were all launched in February 1944 to further the Mandates campaign.■

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SUBCON 2007 TRIP REPORT

by Captain James Patton

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

Between 4-7 September 2007, perhaps the best submarine-associated conference I have ever attended was held in Kiel, Germany, and was sponsored by the HDW (Howaldtswerke-Deutsche Werft) Company, the producers of the type 206, 209, 212 and 214 (among others) series submarines. This was their fourth SUBCON, the others being held in 1995, 1999, and 2003. A special issue of the European Defense Journal *Naval Forces* which contained copies of the papers presented was included in the package provided all delegates.

Figure 1–HDW Shipyard Looking Across the Fiord from Kiel

The conference was held at an unclassified level, with 450 delegates present from 26 different countries and was done entirely in English. Highlights of the conference included:

- Detailed description of the design, operation and H_2/O_2 recharging evolutions for the PEM (Polymer Electrolyte Membrane) fuel cell system installed aboard type 212 and 214 submarines.

- An extensive tour of the building halls where construction of type 212 and 214 submarines was in progress.

- Presentations by several senior submariners concerning the forces and operations of their respective country's submarines.

- Various European approaches to partial solutions to the ubiquitous "Comms at Speed and Depth" submarine issue.

- An extensive tour of the fuel cell and torpedo tube and countermeasure launcher construction facilities.

- A display of various equipments and hardware at the construction hall on the last day of the conference.

Some Specifics

In the HDW fuel cell design, oxygen is stored in a liquid form either in a heavily insulated tank within the pressure hull (type 214) or in external tanks atop the pressure hull. Hydrogen is stored in metal hydride cylinders in external cylinders towards the bottom of the hull. The oxygen is "medical grade" (99.5% pure), and the slight "boil-off" plus the approximate 1% of flow volume through the two 120 KW (type 214) or nine 34 KW (first flight 212s) PEM cells that doesn't react is used for crew breathing consumption. The hydrogen was described as "level 5", and had to be extremely pure (99.999%), since any carbon monoxide or sulfur contamination would seriously damage the PEM membranes. In addition to the exceptionally high purity, hydride recharging was a non-trivial affair, required a good deal of infrastructure on the pier (evaporators, pressure/flow rate controllers etc.), and once everything was present and set up, took about 35 hours of temperature-controlled "soaking" to fully recharge the metal hydride stowage cylinders. The charging process was exothermic, requiring the storage canisters to be cooled, and the at-sea release of the gas required cylinder heating, being endothermic.

The building hall was fascinating, and exceptionally clean and neat by shipyard standards. The type 212 has an austenitic stainless steel hull (to reduce vulnerability to magnetic mines), is about an inch thick, with frame spacing of 8-10 inches and a web length of 4-5 inches. Being non-magnetic, the automatic frame to hull welds could not be checked through magnetic particle eddy current means, and it was interesting to see the entire hull circumference of these welds being checked with dye penetrant means. The equipment installations are *end-loaded* and there was evidence of extensive "rafting" and sound isolation. The sail and *casings* (topside super-structure) were of composite material, and the shipyard was replete with the molds upon which the composite structures were *laid-up* and cured. Also in development there at the yard are replaceable composite blades for their heavily skewed 7-bladed propellers.

Submariners from Germany, Sweden, Israel, Greece, Brazil and South Africa gave presentations about some facets of their countries Submarine Forces and operations. Of significant interest was the fact that when the Brazilian Captain making his presentation was asked if Brazil was working towards a nuclear submarine, his answer was a straightforward *yes*.

Perhaps the most interesting thing seen at the torpedo tube/countermeasure launcher construction facilities were the external countermeasure *clips* installed on the type 214 and other units. The 214, for example, has four such clips, each holding 10 *noisemaker* or *mobile* countermeasures. The countermeasure diameters run from 4 to 8 inches, and doctrine calls for being fired five at a time. There was also one 5-6 foot long launcher under construction with a 10 inch diameter that the touring official indicated was unique to the Israeli *Dolphin* class.

The European company of Gabler is very active in the field of comms at speed and depth and mast design. One of their products features a high data rate mast whose tethered antennas can detach and *fly* to the air-water interface by means of an organic lifting body where it provides two-way comms while being towed by a 300-600 meter cable. When the comms event is completed, the antennas are winched down to be reseated on their mast. Another Gabler innovation is the mast-mounted large watertight container of figure (2) with a hatch operated from within the submarine. One of the employ-

ments of this container is for the launching of the expendable UAV of figure (3) and another is the stowage of an erectable, trainable 30mm recoilless gun (an existing Muraena design found on some armored personnel carriers) with a magazine of 30 rounds. Another advertised use was the dry stowage of SOF equipment.

Figure 2 – Gabler's Mast-Mounted Watertight Stowage Container

Figure 3 – An Expendable UAV

There were several other interesting exhibits. HDW had a mockup of a submarine's after elliptical bulkhead and their electrical actuators. There were also what seemed to be fully developed weapon concepts. One was the 21 inch, torpedo-sized *wooden round* of figure (4) which contained 4 independently fired "IDAS" AAW/anti-small craft weapons

Figure 4 – IDAS Weapon and Launcher

A very valuable part of the conference was the opportunity to talk with other submariners at the very fine catered meals and other social events. For example, while chatting with the Australian delegates, a Commodore and a Commander, the Commodore indicated that he didn't think that Australia would be interested in AIP from an operational point of view. The Commander offered a "yeh, but..." opinion that some form of AIP would be valuable as an *contingency* system—like parachutes for fighter pilots or fire extinguishers and active sonar on submarines—something that wasn't intended to be used, but when *pinned down*" in some shallow water or bay with battery running low, it would be nice to have a week or so of *emergency* propulsion to extricate oneself from adversaries.

In closing, I'm sure there is probably some nuclear/non-nuclear propulsion political rationale that argues against US Submarine Force participation in SUBCON, but it is a rich environment from which to glean valuable insights into not only the cutting edge technologies involved, but also the operational concepts of employing them.■

SUBMARINE NEWS FROM AROUND THE WORLD

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From the October 2007 Issue

CANADA—Victoria Submarine Replacements being Considered

In early October 2007, AMI received information that the Canadian Department of National Defense was on a fact finding mission to see how long it would take to introduce a new construction submarine to replace the trouble-plagued Victoria class. The fact finding comes at a time when the Canadian Navy (CN) finds it increasingly difficult and expensive to maintain the three remaining operational units of the Victoria class (former Royal Navy Upholder class commissioned in the early 1990s) and at a time when the Prime Minister is attempting to bolster the nation's sovereignty over the Arctic.

Sources indicate that the government has been briefed that it would take six to eight years to build four new submarines following contract signing. Design studies and selection would take at least two years prior to contract signing, indicating that if a decision was made today, a construction contract would occur in 2009 and deliveries would occur between 2015 and 2017.

It has become obvious that the CN is very dissatisfied with the performance of the Victoria class, which were procured for US$897M and have faced many mechanical glitches since commissioning into the CN. In addition, the fourth unit, HMCS CHOCOUTIMI, suffered a fire on its maiden voyage and has been laid up ever since. Now, the CN is facing the expense of an additional US$865M to perform a mid-life modernization effort to keep the three remaining submarines in service until 2025. The US$865M for the mid-life upkeep does not include the ever-growing portion of the maintenance budget that is being eaten up by the Victorias and is having an effect on the remainder of the fleet.

The biggest question now appears to be, does the Canadian Government want to cut its losses now and invest in a new construction vessel that can operate in the Northern waters or stay

with the three ailing Victoria class that are less capable and a financial burden for the CN.

The decision on a go or no go for a new construction submarine for the CN probably could not have come at a worse time. The sea service is attempting to get the Joint Support Ship (JSS) Program underway in 2008 as well as planning for a new class of Arctic Offshore Patrol Vessels (AOPS) and the mid-life modernization for the Halifax class frigates. The JSS, AOPS and Halifax modernization have an estimated price tag of around US$5.62B over the next decade. The good news is that the CN has a very proactive proponent with Prime Minister Harper sitting in the Prime Minister's chair, possibly at very opportune time in history. Prime Minister Harper's pro-sovereignty stance over the Arctic could end up being very beneficial to the CN when it comes to modernizing and acquiring new vessels for the fleet.

GERMANY—Marketing New Submarine

In September 2007, ThyssenKrupp Marine Systems (TKMS) announced that they would begin offering a new class of submarine for the export market. Announced at the defense show SubCon 2007 in Kiel Germany, the new submarine design will be geared toward navies with small budgets yet have a desire for a subsurface capability.

TKMS's intention with the Type 210 mod is to be a less expensive direct competitor to the Russian Amur and French SMX-23 submarines and will target navies in South America and Southeast Asia that are looking for low-cost solutions either as an entry level submarine or an alternative to costly overhauls of larger boats.

The Type 210 mod design is an updated version of the Norwegian Ula class. The submarines are considerably smaller and with a less technologically advanced propulsion system than the current Type 212 and Type 214 currently being offered by TKMS on the international market.

The submarine displaces 1000 tons submerged and has a length of 56 meters (183.7 feet), slightly smaller than the Ula class. It will be powered by two Tognum (MTU) 12V 396 diesel engines charging the battery banks that power the quiet Permasyn electric motors.

It will have a 30-day endurance with a 15 to 21-man crew and

will be armed with eight 533mm torpedo tubes for 14 heavyweight torpedoes. Mine or missile capability may be installed if requested by the customer at additional cost.

Additional features include:

- Single hull of HY-80 steel
- Small sail for signature reduction
- "X" rudder configuration
- 7 bladed skewback propeller
- Optical periscope, telescoping communications mast and 2-man diving chamber installed in the sail
- Bow, flank and obstacle avoidance sonars

The Type 210 mod could become an attractive candidate for most of South America's navies, which currently operate several different variants of the TKMS Type 209 or countries such as Thailand wishing to reenter the submarine market or possibly first time aspirants such as Bangladesh and the Phillippines.

Various Did You Know?

Malaysia—On 23 October 2007, the first Royal Malaysian Navy (RMN) Scorpene class submarine was named KD TUNKU ABDUL RAHMAN.

From the November 2007 Issue

THAILAND – Submarine Procurement Plans Surface Again

In late November 2007, AMI received information indicating that the Thai Ministry of Defense is planning for a new weapons procurement package that could cost up to 300B BHT (US$9.7B) over the next ten years (2009-2019). The request by the Ministry of Defense will be presented to the new government that will take power in late December 2007. Elections will be held on 23 December for a new government to replace the military government (Council for National Security) that has been in power since the overthrow of Prime Minister Thaksin Shinawatra on 19 September 2006 in a bloodless coup.

In addition to the procurement package, the Ministry will also

submit its annual military budgets for 2009 through 2011. With the military running the government throughout 2007, the Defense Ministry did receive a significant increase in the 2008 budget totaling US$4.5B up from US$2.6B in 2007. From 2009 through 2011, the proposed budgets will stabilize at around 150.8B BHT (US$4.8B) for 2009, 150.9B BHT (US$4.8B) for 2010 and 148.1 BHT (US$4.7B) for 2011.

In regards to the new procurement package, the priority for the Royal Thai Navy (RTN) appears to be for the acquisition of a submarine capability. Recent comments from the Navy's Commander-in-Chief, Admiral Sathiraphan Keyanon, continue to confirm the nation's concern about the growing submarine capabilities in the region. China's historic and growing submarine threat in addition to the recent acquisitions by Malaysia, Indonesia and Singapore have only heightened the concern of the Navy leadership.

Although there has been a general concern over the past decade regarding the submarine threat, there has been little movement in the way of procuring a Submarine Force for the RTN, although there have been various attempts since 1995. A US$800M submarine program that began in 1995 with the issuance of international tenders ended with the project being cancelled by 1996. Follow-up defense budget submissions from 1996 through 1999 all but eliminated any funding for an undersea service. By 2000, the RTN was again considering a submarine program and began investigating the used market when in reality funding was never available for such an endeavor.

The most recent submarine procurement plan surfaced in 2005 when the new CNO Admiral Sampop Amrapala announced Mega Project, the 10-year re-capitalization plan for the RTN. Mega Project enjoyed support from then Prime Minister Thaksin Shinawatra prior to his departure from office. As per Mega Project, two submarines were to be procured by 2017 with the program beginning in 2012. It appears the latest announcements concerning the new 10-year procurement plan (2009-2019) that also includes a Submarine Force, may be following a similar timeline as the submarine procurement mentioned in the 2005 Mega Project.

When Mega Project was announced in 2005, AMI questioned the timeline and the aggressiveness of the RTN plan to re-capitalize its

fleet even considering the support of the Prime Minister. One must now question the Defense Ministry's plans to submit various budget proposals to a new civilian government that has yet to be elected or formed.

In reality, a 10-year US$9.7B procurement plan in conjunction with three successive defense budgets for 2009, 2010 and 2011 that are approximately 100% higher than the pre-coup defense budgets must be questioned. These plans are extremely aggressive and could be a pressure tactic by the military prior to the new civilian government entering office. Planning on the idea that a new government would pass such high budget requests at its outset must be considered risky. AMI believes that, like in the past, the RTN will have a difficult time procuring submarines under these new political conditions.

AMI believes that if the RTN is to begin a submarine program in the near term, it will have to be a top priority not only within the RTN, but at the highest levels of the Defense Ministry and the newly formed government if it intends to get full funding to get the program off the ground. If the RTN is successful in attaining full funding under these new political realities, it will, like in its past endeavors, issue an international tender to international submarine builders including ThyssenKrupp, Fincantieri, Rubin Design Bureau, Navantia, DCNS and the China State Shipbuilding Corporation.

UNITED STATES

2008 Shipbuilding Funds Increase

On 13 November 2007, President Bush approved the US$471B defense-spending bill (2008 Defense Appropriations Act) that had been passed by both the US House and Senate. Of this amount, the US Congress appropriated US$13.7B for the construction of five ships in 2008. This is an increase of approximately US$2B over the Fiscal Year (FY) 2007 Shipbuilding & Conversion Navy (SCN) budget.

The five new vessels authorized in FY 2008 include one Virginia class submarine, one DDG-1000 Zumwalt class destroyer, one CVN-21 class aircraft carrier, one San Antonio class amphibious transport ship (LPD), and one LHA-6 class amphibious assault ship (LHA). The bill adds additional funding so the USN can begin long-lead

procurement on five additional vessels. Long-lead funds are for one Virginia class submarine, one San Antonio class LPD, and three Lewis & Clark class cargo ships (T-AKE). The increase in 2008 seems to be the beginning of Representative John Murtha's pledge to increase USN shipbuilding to 10 ships per year over the five-year period 2009-2014.

Considering the increase in the 2008 budget, it now appears that Congress and the USN may finally be on the same wavelength when considering the inadequate funding levels of the past; although there is still some disagreement as evidenced in the case of the Littoral Combat Ship (LCS). The 2008 budget sets aside additional funding for advanced procurements although notably missing from the budget is funding for additional LCS units in FY 2008. Only US$339M has been allocated in the latest budget for the LCS program. This funding will be used to complete construction of the first two LCS units. Lawmakers stated that in order to receive future funding for the program, the USN must down-select to one design by the end of 2009. Once a selection is made, the Navy must open bidding for LCS construction to multiple shipyards for fixed-price contracts, at which time AMI expects Congress will again begin funding multiple platforms each year until the USN reaches its goal of 55 units.

Although it appears that there is some agreement on increasing the SCN budget in the near-term for future procurements; one must wonder how long this drive can be sustained. The question must be asked as to whether any future SCN funding will eventually be utilized for the current forces in Afghanistan, Iraq, and other areas in support of the war on terrorism. The operational tempo of these units has been significantly increased over the past 5 years and will begin to translate into a need for high funding levels to replace, repair, and or modernize both naval and naval aviation units in the USN. The need for this funding may, at some point, begin to cut into the SCN budget.

TURKEY

Three Bidders in New Type Submarine Program

On 12 November 2007, the Turkish Undersecretariat for Defense Industry (SSM) announced that it had down-selected to the three

final candidates in the case of the New Type Submarine Program. France's DCNS, Germany's ThyssenKrupp Marine (Howaldtswerke-Deutsche Werft - HDW) and Spain's Navantia were listed as the finalists, with Fincantieri and Lockheed Martin excluded from the short-list. The announcement follows the Request for Proposal (RfP) that was issued on 28 December 2006 with a closing date of May 2007.

With the down selection now complete, the SSM will further evaluate the three proposals with a preferred bidder being announced sometime in 2008. A construction contract could be in place by 2009 as the Turkish Navy has a requirement for all six submarines to be in service by 2016.

Turkey, which has historically utilized German solutions for its Submarine Force, will build all six submarines at the Golcuck Naval Shipyard with maximum use of existing in-country industrial means and capabilities. The winner is expected to team with local vendors with experience in command and control software to work with the combat system integrator on the development and installation of the Integrated Underwater Command Control System (IUCCS). The winner is also expected to assist the local sub-contractor in building up the necessary capability for maintenance, repairs, development, modification of the IUCCS through the life cycle of the vessel.

Due to Germany's historical ties as suppliers to Turkey's Submarine Force, ThyssenKrupp Marine must be considered the front-runner in this competition. However, if DCNS or Navantia offer a better pricing and/or teaming arrangement with local Turkish companies, it may be possible to unseat Germany as Turkey's premier submarine supplier.

ITALY

2008 Budget Growth to Support Naval Programs

In late October 2007, AMI received information that the Italian Ministry of Defense (MoD) is planning to begin the procurement of several major Italian Navy (IN) programs. The planned 2008 budget totals €15.22B (US$22.3B) and is now awaiting parliamentary approval, which is expected in January 2008. This amount equates to an increase of 5.4 per cent over the 2007 budget with nearly an 11 per cent increase in procurement.

Specifically, defense officials have stated their intention to fund the procurement of two additional Type 212 submarines, which will cost €915M (US$1.34B). Additionally, € 10M (US$14.2M) will be allocated to begin a nearly € 400M (US$586.6M) program for the replacement of the IN's aging Atlantic maritime patrol aircraft (MPA) by 2016. Currently, no replacement has been selected but since the IN withdrew from the US Multi-mission Maritime Aircraft (MMA) program, the leading contender seems to be the Aerospatiale ATR-72.

In addition to the programs specifically listed in the spending document, the MoD refers to other acquisitions outside the defense budget that include four additional New Generation Frigates (FREMM - destroyers). No specific numbers were stated, but the cost per unit of the first two vessels is estimated at around US$670M each.

The current budget proposal is certainly a step in the right direction while still staying within the European Union (EU) guidelines of defense spending (1 per cent of GDP) equating to about .95 per cent of GDP. However, as mentioned earlier, other programs such as the FREMM destroyers will need to be funded (within or outside of the defense budget) if the sea service intends on getting all ten units that it is currently planning for.

BRAZIL

2008 Defense Budget Increases, Will SSN Move Forward?

In late October 2007, the Brazilian government announced that it would be increasing military spending by around US$1.5B in 2008. The current defense spending plans calls for a budget of approximately US$5B in 2008, a US$1.5B increase over 2007 spending levels. According Brazilian sources, the budget could increase to as much as US$5.64B. Of the latest budget request, US$1.2B will be allocated to the Brazilian Navy (BN).

Of the allocated US1.2B for the Navy, approximately US$840M is currently slated for completing the development of a nuclear submarine (SNAC-2 Program) by 2013. The discovery of new oil reserves earlier in the year has reinforced the BN's justification for the nuclear submarine program. Although plans call for 66 per cent

of the naval budget to fund the SNAC-2, AMI believes that this number has to be skewed as the rest of the sea service will only receive around US$360M for the year.

In addition, the Brazilian nuclear submarine program has been plagued by delays since its inception and it is hard to imagine investing such a high portion of the naval budget in this fashion when the program continues to face setbacks. First and foremost, the testing of the reactor at the land-based facility is expected to last through at least 2010 and this date must be considered optimistic considering the historical delays in this program. Recent information also suggests that the Brazilians may be considering outside help in the nation's civil and military nuclear programs.

Earlier in the year, Roberto Unger (head of the Brazilian president's long-term planning unit) visited India and France for talks on transfers of technology for the enrichment of uranium. The talks on transfer of technology indicate that Brazil may still be having trouble enriching uranium that would be required for the nuclear submarine propulsion plant.

Although the SNAC-2 Program has been considered "the pride of the nation", reality suggests that the first SNAC-2 will not be delivered until well after the 2013 date currently anticipated by Brazil. AMI believes that the reactor testing will more than likely stretch beyond 2010 due to technological issues. Once the reactor testing is complete (probably around 2016), the sea service will only then be able to begin thinking about funding the first hull of the SNAC-2. In the near-term, the BN faces more important issues such as the acquisition of replacements for its surface fleet as well as modernizing its five-unit diesel submarine fleet.

From the December 2007 Issue

INDIA—Timeline for Second Submarine Line

In early December 2007, AMI received information concerning the Indian Navy's (IN) time frame for its second submarine line. Sources indicate that the IN is continuing its preparations to open its second submarine line by ordering a new design of conventionally-powered submarines to supplement the Scorpene class that began construction in 2006.

It appears that India will release an international tender by late

2008 or early 2009 for the new submarine design. Although this tender will be offered to all interested builders, this program is tied to a new submarine that has a vertical launch capability for ballistic or cruise missiles. AMI identifies the second submarine line as the Amur Class Conventionally-Powered Attack/Guided Missile Attack Submarine (SS/SSG) (Project 78).

The project is so referenced due to the IN's interest in acquiring a platform to further develop the Navy's land attack capability. The history of the vertical launch missile capability dates back to 2003, when Russia made a formal offer to India for an elongated version of the Amur 950 class submarine. The elongated version has a 10-cell missile deck that can deploy the joint (Indian/Russian) produced BrahMos missile, which currently is produced in the anti-ship (ASM) variant and being modified to perform land attack missions. The elongated Amur 950 was offered as the only foreign design available for the IN that has the capability to launch the BrahMos missile.

AMI's sources in early 2005 indicated that the Amur would more than likely be selected for Project 78 with sections being built at Larsen and Toubro at Hazira and Mazagon Dock Ltd (MDL) in Mumbai with final assembly at Vishakapatnam Naval Dockyard (VND).

Following the Scorpene deal in October 2005, the IN was ready to move forward on Project 78. However, by March 2007, AMI sources indicated that the IN would be required to open its second submarine line to an international tender. Even though the Amur 950 deal was expected to be sealed under a Russian/Indian government-to-government deal, the new Defense Procurement Procedures (DPP) enacted in 2006 stated that all future equipment purchases would be through a multi-bid mode (open competition) unless there are exceptional circumstances preventing such a bid. Project 78 now falls under these new rules requiring an open bid even though the Amur 950 appears to be the only submarine that meets the requirements of the IN (VL BrahMos shooter).

In the open competition format, we expect other foreign bidders will submit alternatives to the Amur 950 design, including Navantia with the S 80, ThyssenKrupp Marine (HDW) with the Type 214, Armaris with the Scorpene and Italy with its Type 212 or one of its

own indigenous designs. It is also known that India requires the foreign supplier to perform a 30% offset requirement just to receive consideration. AMI believes that as long as Indian retains its requirement for vertically-launched BrahMos in this new class, the Amur 950 will be the only qualified design. None of the others will have the capability to fire vertically launched missiles without major design modifications that would surely be more costly as well as time consuming.

Assuming that the international tender is released by late 2008 or early 2009, the IN could make a final design decision by 2010 with construction beginning by 2011. As mentioned earlier, AMI believes that if the vertical launch capability is still required for this program, then the elongated Amur is more than likely the candidate of choice.

NORWAY — Still Committed to Future Submarine Fleet

In early December 2007, AMI received information that the Royal Norwegian Navy (RNoN) had begun concept studies in regards to its Future Submarine Program. The Future Submarine Program is expected to replace the six Ula class submarines that are currently in service. The Ula class was commissioned from 1989 through 1992 and will remain in service until 2020.

Originally, the Ula class was to be replaced by units developed under the Viking Submarine Program of which Norway was one of the three participants. However, by 2002, Norway withdrew from the program opting to replace its Submarine Force on its own rather than proceed forward with the joint program. The requirement to replace the Ula class was reaffirmed by the Norwegian Chief of Defense in 2005 when he publicly stated the importance of retaining a modern submarine fleet.

Known as Project 6346, the concept studies being conducted by the Defense Ministry, Defense Logistics Organization and the Defense Research Establishment will outline the requirements for the capability to replace the Ula class with completion expected by the close of 2008. A follow-up detailed definition study will probably start in 2009. If the program moves forward, a construction contract could be in place by 2013 with Requests for Proposals (RfPs) being released by 2012. The first unit will probably enter service by 2017 followed by five additional units through 2022.

Norway, which has no submarine building capability, will have to rely on a foreign builder to satisfy this requirement. Although this program is in the very early stages, Germany's ThyssenKrupp Marine would have to be considered the early leader due to Norway's long-term relationship with Germany in the submarine field. All of Norway's submarines have been built by Germany. In addition, it appears that Norway's Kongsberg Defense Aerospace (KDA) has solidified its position in the German submarine market (indigenous and export) by providing the MSI-90U combat management system (CMS) for both the German Type 212A and Italian Type 212A submarines. A modified variant of the MSI-90U would probably also be selected for Norway's new submarines.

FRANCE—Barracuda Submarine Program Underway

In late December 2007, AMI received information that the French Barracuda Class Nuclear Submarine Program had officially begun. The *first cut* ceremony was held at DCNS's Cherbourg yard on 19 December. The first unit of the class, SUFFREN, will be commissioned in 2016. The entire class will consist of six units that will enter service through 2027.

On 23 December 2006, the Delegation Generale pour l'Armement (DGA) announced that it had awarded a construction contract for six units of the Barracuda class to DCNS. The second unit of the class, DUGUAY-TROUIN, will probably begin construction in 2009. The Barracuda class will replace the six Rubis Amethyste class that were commissioned from 1983 through 1993.

DCNS Cherbourg is responsible for production engineering and contracting arrangements, pressure hull construction, equipment and system integration and outfitting. Other DCNS facilities involved in the program include the propulsion business unit at Nantes-Indret, naval equipment unit at Ruelle and the security and information systems division at Toulon-Le Mourillon.

DID YOU KNOW?

JAPAN - On 14 December 2007, the first Improved Oyashio class submarine for the Japan Maritime Self Defense Force (JMSDF), SS 502, was launched at Mitsubishi Heavy Industries' Kobe shipyard in Japan.■

THE SUBMARINE COMMUNITY

SUBMARINE HEROES IN AUSTRALIA

by CDR Steve Mack, USN

CDR Steve Mack USN enlisted in the Navy in 1986. Selected for the Nuclear Enlisted Commissioning Program, he received his BSEE with honors from the University of New Mexico in 1991. He also completed a MSEE with honors from Johns Hopkins University.

In 2001, CDR Mack was selected as the first US Navy submariner to attend the Royal Navy Submarine Command Course –"Perisher". Upon successful completion, he reported to Submarine School as Assistant Director for Officer Training and Director Modernization Training Team.

His sea duty has included Sonar Officer, Electrical Assistant, and Damage Control Assistant, USS ALASKA (SSBN 732) (GOLD); Navigation and Operations Officer, USS MEMPHIS (SSN 691); and Executive Officer, USS VIRGINIA (SSN 774).

CDR Mack is currently on assignment in Australia as the Principal Staff Officer for Operational Preparedness and Tactical Development at the Submarine Headquarters at HMAS STIRLING.

As the only submariner stationed 'down under', I had the honor of representing the United States Submarine Force at ceremonies in Western Australia. In March 2007, I was invited to be the guest speaker at the Memorial Day Wreath Laying at the US Submarine Memorial in Albany, Western Australia. At the time, I was reading an excellent book on the story of the USS HOUSTON, Ship of Ghosts, by James D. Hornfischer. The story chronicles the loss of HOUSTON in the battle of the Sunda Strait, along with the Australian frigate HMAS PERTH. PERTH was commanded by the famous CAPT Hector Waller, after whom the Australian submarine WALLER is named. After the sinking, the

book follows the crew through the remainder of the war until, as prisoners of war, they are rescued.

While compiling my remarks, I reflected on the accomplishments of the isolated from submarines and surface ships of the Asiatic Fleet at the start of World War II. Following the attack on Pearl Harbor, these forces were isolated reinforcement or resupply. Following action in the Java Sea, HOUSTON and PERTH found themselves running short on fuel and ammunition. The Commanding Officers decided to make a run for Australia thru the Sunda Strait where they could resupply and conduct needed repairs.

While proceeding through the Sunda Strait, they encountered a Japanese invasion force consisting of 9 DDGs and 3 CGs along with countless auxiliaries. These two ships put up a courageous fight, resulting in a large number of destroyed landing craft and auxiliaries, but in the end were overwhelmed by a numerically superior force.

Following their sinking, survivors of the HOUSTON and PERTH struggled to make land. Those that made it ashore were eventually taken prisoner by the occupying Japanese forces. Many of these were sent to work for nearly a year on the Burma-Thailand railway. This railway was made famous by the movie Bridge Over the River Kwai. What the movie did not address were the atrocities committed against the prisoners resulting in a death rate of over 20%.

As if that experience was not trying enough, upon completion of the railway, the remaining prisoners were placed onto two unmarked troop transport ships bound for labor camps in Japan. By this time, the strangle hold of the US Submarine Force on all Japanese shipping was beginning to take effect and these three unmarked troop transports were sunk by a US submarine wolfpack consisting of PAMPANITO, GROWLER, and SEALION II. Because they were unmarked, the submarines had no way of knowing the ships were carrying prisoners of war. Survivors of the sinking were left on their own. Japanese ships that were alerted to the sinking came to the rescue of the crews of the transport ships, but either left the prisoners to drown or shot them.

After several days in the water, the remaining survivors were found by the submarine PAMPANITO. She took onboard 73 men, the absolute maximum the boat could handle, and made for port. An immediate search and rescue effort was launched by COMSUBPAC

sending three additional boats to the area at best speed to attempt a rescue of any other survivors. Other submarines involved in the rescue efforts were BARB, SEALION II and QUEENFISH. Of an initial 1318 men on the two transports, a total of 159 were rescued by the submarines.

At the Memorial Day event, I spoke to the efforts of the Australian military and civilians who worked so closely with our Submarine Force. I also recounted the story of HOUSTON and PERTH and the incredible story of their survivors, twice sunk and then rescued by US submarines.

As the ceremony ended, I was approached by a gentleman wearing a QUEENFISH ballcap who identified himself as a PERTH survivor! His name is Arthur Bancroft and my wife and I had the privilege of spending the afternoon talking with him. Over drinks and lunch, Arthur shared with us his experiences as a prisoner of war and his subsequent rescue. We were thrilled to learn that, while a POW, Arthur had kept a secret diary which he recently donated to a history museum here in Western Australia. With frankness and even a little humor, Arthur captivated us with stories of the trials and torments he and his mates endured as prisoners of war. We will never forget these stories or the amazing World War II veteran who shared them with us.

Arthur was 17 when he enlisted in the Royal Australian Navy and was barely 19 when PERTH was sunk. Following his second sinking, he spent five nights and six days in the water. Upon his rescue, he saluted the Captain on the bridge and requested permission to come aboard! The Japanese had nearly broken his body, but his spirit was still as strong as ever. The sailors on QUEENFISH were so impressed with Arthur's enthusiasm and attitude, that they presented him with his set of Silver Dolphins with full rights and privileges of a true submariner. In fact, at all Submarine Memorial Ceremonies Arthur can be seen wearing his blue Submarine Veterans vest, with his Silver Dolphins and his QUEENFISH ballcap.

For Arthur, his rescue began a relationship that continues to this day. Each year on the anniversary of his rescue, Arthur called the Commanding Officer 'just to say thanks and let him know I was still alive'. As the Captain's health declined and he passed away, Arthur

began calling the Executive Officer. He also calls every July 4th to wish America a happy birthday. I look forward to seeing Arthur again next year at the Memorial Day Ceremony and once again thanking him for his service and sacrifice.

Enclosed photos:

Arthur Bancroft reading the Tolling of the Boats

CDR Steve Mack (then LCDR) and Arthur Bancroft

MY CACO EXPERIENCE

by LT Bradley D. Harrison

Lt. Harrison is serving as SSG Assistant Unit Head in the Strategic Systems Program Office.

Walking through those doors brought back distant memories from six years before. I was a young midshipman then, eager to complete my pre-graduation physical, report to my first submarine, and really begin serving my country. This visit was different. I walked through the doors in a new and unfamiliar role—as a Casualty Assistance Officer for a traumatically wounded Navy SEAL. At the time I had no idea what that meant. Our office was asked to provide a volunteer, my travel schedule for the upcoming month was light, and I raised my hand. Walking into the hospital, I was bombarded by the usual smells and sights, countless babies and retired folks. I asked the front desk how to find Ward 5. I hopped on the elevator and five seconds later the doors opened to ordered, life-changing chaos. I was swiftly introduced to Courtney, the wife of the injured warrior. She was beyond distraught. Chris had been medically evacuated from Iraq a few hours earlier—he suffered four gunshot wounds, was missing his nose, and could not use his left arm. He had a stripe of hair missing where another bullet had grazed his scalp; he was lucky to be alive. He could not talk; he communicated via blank white paper and a roller ball pen. His mother, father, step-mother, sister, brother, and aunt rushed up to me, asking for help. Questions came like a sandstorm. "Can you find a speaker for his phone?" "How long will Chris be here?" "Will he be OK?"

I was overwhelmed but calm; I knew I could help this family. I methodically approached the diverse issues and developed corrective courses of action. I found the IT department and requested a phone with speakerphone capability. Chris could hear, but his family would read his written responses to callers. I found the Personnel Support Detachment and processed paperwork to reimburse the family for their travel expenses and future hotel stays; I made hotel arrangements, haggled with Sprint PCS regarding Courtney's inflated cell-phone bill since the tragedy, mailed letters, wrote emails, drove

friends and family to the airport, bought groceries, took their children to the zoo, drew simplified travel maps of the DC area, coordinated VIP visits, and delivered meals to the family, and yet all the while, over the course of three weeks, I had not heard Chris's voice.

The voice! The voice! I know his bank account number but not his voice! We spend hours together in a room—I talk, he writes in response. He writes about his SEAL experiences, his children, his childhood, his enlisted days, and his time as a college man. In my Acinetobachter-proof yellow gown, gloves, and surgical mask, I ask question after question. The man fascinates me, yet I have not heard his voice. I pick his brain; he continues to motivate me to serve people and our country. We discuss his hand-written warning on the door: DO NOT ENTER IF YOU COME WITH SORROW. THIS IS A PLACE OF RAPID RE-GROWTH AND JOY. I WAS INJURED PERFORMING A JOB I LOVE FOR A COUNTRY I LOVE. THANKS, THE MANAGEMENT. As we discuss the sign, Congressman Murtha arrives, followed by the Dallas Cowboy's Cheerleaders and singer/actor Henry Rollins. America!!!

A few days later as I inject water into his lock-wired mouth, we communicate again, but this time he talks! Chris talks through his tracheotomy, causing me to shed tears. Two naval officers: one hero and one volunteer, one hard-hitting SEAL and one nerdy submariner, connected, communicating by voice. Advocating for his family, hearing his voice, seeing his children laugh around their daddy, knowing he was one centimeter from death…the voice lives on! I hear it regularly now as the voice of a friend, and there is no sound like it in the world.■

THE THREE MUSKETEERS AND THE SUBMARINE WARDROOM

by Capt. James H. Patton, USN(Ret)

Captain Jim Patton is a retired submarine officer who is an active consultant in submarine matters to government and industry. He commanded USS PARGO (SSN 650) and is a frequent contributor to THE SUBMARINE REVIEW.

In any *good* submarine, there is almost invariably a group of three fairly senior Lieutenants who have served on another submarine or two, consider themselves extraordinarily well qualified at both ends of the ship, and, as a group, are as cocky and arrogant as any stereotypical naval aviator as made famous by the movie *Top Gun*. It is right and proper that they be so, for the alternative, just as with pilots, is probably failure under stress.

These modern day Three Musketeers truly believe (and again on a *good* submarine the Skipper lets them) that *they* are the true architects of the boat's successes and protectors of its reputation, but are magnanimously willing to let the CO take the credit—since he really is a good guy and was probably a pretty good Lieutenant a long time ago before he got old. They mentor and feel responsible for the younger, unqualified officers and protect them from anachronistic meddling by the well-meaning but somewhat dull and unimaginative LCDRs—who, after all, with the real running of the ship in capable 0-3 hands, are free to spend inordinate amounts of time fretting about all sorts of trivial and esoteric matters. The probability that they the Musketeers might someday have to pass through this 0-4 wicket is vaguely accepted, but is tempered by the assumption that they will be different than the current crop, and will continue doing what they are presently doing but with a different collar device and higher pay.

The crew realizes that these three are the virtual *shakers and movers* of the boat, and closely identify with which of them is their section OOD or EOOW. The healthy and constructive competition that emits sparks between these Lieutenants having permeated into their watchstanders, they too try to best one another with *oolies* – obscure factoids about the ship and its systems. A word of praise or

encouragement from these officers is treasured, and even a disapproving look has the power to initially crush, then spur to greater effort.

Meanwhile, the CO, who had unobtrusively orchestrated this consortium of middle-management phenoms—and really was a pretty good Lieutenant before he got old – quietly sits at the conn, on the bridge and in the wardroom, takes extraordinarily good reports, watches them play like a Mother bear watching her cubs and thinks, in the words of Mel Brooks, "It's good to be King".

Thus is the nature of a good submarine's Three Musketeers. Not all boats have them, but all boats should aspire to create them.■

ASSOCIATE

Mr. Jay W. Dietrich
CAPT Yanai Zvi, Israeli Navy (Ret)

ADVISOR

CAPT Wilson Fritchman, USN (Ret)

SKIPPER

ADM A. Clemins, USN (Ret)
Mr. Victor E. Hulina
RADM Lloyd R. Vasey, USN (Ret)

LIFE MEMBERS

CAPT Nelson A. Blish, USN (Ret)
LCDR Richard Hausvik, USN (Ret)
CAPT Brian T. Howes, USN (Ret)
CAPT Richard J. Reuss, USN (Ret)
RADM Dickinson Smith, USN (Ret)
Mr. Brian W. Wynn
ST1(SS) John I. Wynn, USN (Ret)

ETERNAL PATROL

LTJG Gary M. Trammell (SS) (Ret)

DOLPHIN SCHOLARSHIP FOUNDATION RACE TO THE NORTH POLE

The race is on! To celebrate its 50 Years of Scholarships in 2010, Dolphin Scholarship Foundation is planning several special events. The kick-off event in 2008 will honor the 50th anniversary of the voyage of USS NAUTILUS (SSN 571) under the Arctic ice. Called the **"Race to the North Pole,"** this unique fundraising event will allow all submariners, past and present, to honor NAUTILUS and their own favorite U.S. submarine.

The historic voyage of USS NAUTILUS to 90° North originated from Honolulu, Hawaii, on July 23, 1958. Approximately 4500 nautical miles later, on August 3, 1958, CDR William R. Anderson, Commanding Officer, announced to the crew, "For the world, our country, and the Navy – the North Pole." USS NAUTILUS made the first transpolar voyage by a ship in history.

This is a virtual race; submarines will *not* actually get underway. Thus, any U.S. Navy submarine, whether commissioned, decommissioned, still on patrol, nuclear or diesel powered is eligible to enter. The first submarine to *travel* 4500 NM and *reach* the North Pole will win this virtual race. One (1) nautical mile will be awarded for each dollar donated to Dolphin Scholarship Foundation and credited to a submarine designated by the donor.

The race officially begins April 11, 2008, and ends August 3, 2008. All donations for the race must be received by August 3, 2008. Money may be donated by individuals, active commands, groups (such as reunion groups, wardrooms or Chiefs' Quarters) or corporations. For more information, contact Dolphin Scholarship Foundation at info@dolphinscholarship.org or call (757) 671-3200.■

DISCUSSION

MORE ABOUT SUBMARINES IN LITERATURE, FILM AND TV

by Mr. Joseph A. Palmee

Mr. Jim Bloom's survey of films, television productions and submarine books in the April 2007 issue of The Submarine Review has prompted me to comment.

The article devotes some space to two quintessential *war pictures* of the era (1941-45), Crash Dive (1943) and Destination Tokyo (1944). The purpose of both was to promote public morale and patriotism but also the careers of Tyrone Power (who became a Marine Aviator immediately after completion of Crash Dive) and Cary Grant, then at the height of his career.

Mr. Bloom makes an excellent observation when he writes: "Scenes inside the submarine (Destination Tokyo) were shot on soundstage sets (which were constructed to be unrealistically spacious)". The same criticism holds for the interior shots of the submarine (actually USS MARLIN - SS205) loaned by ComSubLant to make the film.

With regard to Crash Dive, there are several positive points to make:

1. The technicolor photography is wonderful
2. The pyrotechnics late in the film are magnificent
3. Excellent - but all too few, shots of The Lower Base and of MACKEREL (SS-204) and an "O" boat at their berth - An overview of The Sub Base waterfront looking down-stream includes the *new* automobile bridge over the Thames River. Then about 20% complete.
4. A marvelous shot from overhead of MARLIN outbound in the Thames River, possibly taken from one of the bridges.

The original story was by W. R. Burnett, who was the author of a number of *tough guy* novels, notably Little Caesar (1929) which

was made into the famous gangster film of the same name (1930). As a screenplay, the story was cliche-ridden, a combination of cannonball melodrama and fantasy. Only MARLIN was able to *get below the surface* of the story!

Turning to Destination Tokyo I find some interesting points:

1. Submarine COPPERFIN departed Mare Island on Christmas Eve, 1941... In the forward torpedo room the COB was describing for *the new men* board, the occasion, *The previous Christmas* (1940) when his submarine was *depth charged* off Java, presumably by the Dutch!
2. COPPERFIN made no reported port calls between Christmas Eve 1941 and April 1942 (the month of the Doolittle Tokyo raid); one is disposed to look upon her *Oil King* as a miracle man! Similarly, the ability of the boats evaporator to provide fresh water so that the crew were able, always to be clean shaved and well turned out is another miracle. But I suppose that 'In the movies we can do anything."

I am familiar with the mission of THRESHER (SS-200) to act as weather ship for the Tokyo raid and can't help but wonder what her crew thought while watching Destination Tokyo during their time off watch!

It is interesting to note that the initial technical advisor on the film was the late Dudley W. Morton, Skipper of the famous WAHOO (SS-238). He was succeeded by LCDR Philip Compton who had retired on disability prior to the war and was an experienced submarine officer. A photo of CDR Horton inspecting the mock-up compartment of the submarine was published in the theater arts section of The New York Times on a Sunday in 1943.

I should like to offer a list of three submarine films which were made during the 1930's and are examples of better motion pictures, even with their limitations, than the two films discussed:

Morganrot (DAWN) UFA German 1933
Hell Below MGM/USA 1933
Submarine D-1 Warner/USA 1937

Three other American features between 1929 and 1939 are worthy of note for the reasons given:

Men without Women Fox/USA 1928

1. Made in San Diego aboard a *Bureau* S-boat (S-11/17)
2. Trite, melodramatic, too much bar hopping by sailors on liberty
3. Part silent/part soundtrack
4. Realistic interiors; poor model/work
5. A few shots of *Bureau* S-boats operating on the surface
6. Directed by John Ford
7. No connection to the anthology of short stories by E. Hemingway with the same title

The Seas Beneath Fox/USA 1933

1. Filmed off Catalina Island
2. A WWI story involving a Q ship and a U-boat
3. The U-boat is *played* by USS ARGONAUT (SS-166) (SM 1). At the time *still* skippered by CDR William Quigley SM-1, who had commissioned her at Portsmouth in 1928
4. A corny story, but good sea action shots
5. Interiors looked realistic, but few shots
6. Directed by John Ford

Thunder Afloat MGM/USA 1939

1. Another WWI story involving a Q ship and a U-boat
2. The U-boat is *played* by USS STURGEON (SS-187), then almost brand new
3. Interestingly only for the few shots of STURGEON. The underwater shots are from Hell Below

The German film Morgenrot (Dawn) UFA 1933

1. Utilized a Finnish submarine of the Vetehinen* class
2. Described the exploits of a U-boat in the North Sea in WWI
3. Very realistic interiors; grittiness of life aboard well communicated
4. The climax is a Q ship vs. U boat battle
5. Melodrama is minimal; fatalism predominates along with

patriotism
(*designed by the illegal German Design Bureau)

6. In German, no sub-titles, but story is easy to follow
7. It premiered in Berlin on the night of the day that Hitler became Chancellor. He attended the premiere with his entourage and though a landlubber he acclaimed it!

Hell Below MGM/USA 1933)

1. A complete re-working of Pigboats (1931), a novel by Commander Edward Ellsberg, USN, which dealt with American *L* boat operations out of Bantley Bay, Ireland, in WWI.
2. The Submarine USS AL-14 was *played* by USS S-29(SS-134)
3. The film was made at Pearl Harbor and featured the sinking by S 29 torpedoes of a laid-up four stacker DD disguised as an enemy minelayer.
4. EXCELLENT interior shots; realistic studio mock-ups and exciting sea action shots. The interior *grittiness* of submarine life is well depicted; excellent underwater shots of S-29
5. The study as it departs from the submarine activity is completely ridiculous and detracts from the impact of the film
6. Walter Houston and Robert Montgomery were featured; well directed by action film specialist Jack Conway

Submarine D-1 Warner/USA 1937

1. One of serval recruiting posters made for the Navy by Warner Brothers (others: Here Comes the Navy, Devil Dogs of the Air; Wings of the Navy, Dive Bomber)
2. Original story by LCDR Frank W. *Spig* Wead, USN (Ret.)
3. The story is absolutely worthless and trite to the greater degree but the film, although with inaccuracies, provides a fascinating picture of submarine school activities in the 1930's

4. The film is replete with shots of the fleet during operations, interspersed with operations by Squadron Six, based on USS HOLLAND (AS-3) at San Diego
5. Vessels were referred to by their real names, including
   - USS DOLPHIN (SS-169)
   - USS FALCON (AS R-2)
   - USS ORTOLAN (ASR-5)
   - USS CINCINNATI (CL-6)
6. The McCann/Momsen Rescue Chamber is shown in operations as well as training in the Momsen Long escape device
7. The model work of DOLPHIN is excellent and was featured in an article in one of the science magazines in the late 1930's
8. The director was Lloyd Bacon, a naval reserve officer
9. Music of the most stirring appeal was by Max Shriner and was re-orchestrated for the film DIVE BOMBER (1941) with original story by *Spig* Wead who re-worked the submarine theme he had previously used to a beautifully photographed Technicolor film concerning research in aviation medicine.

In closing, I must apologize for the length of this article but I was so stimulated by Mr. Bloom's article that recollections kept occurring to me.

You may have gathered that I much enjoy my membership in the Naval Submarine League and your magazine.■

BOOK REVIEWS

AND THE BAKER'S BOY WENT TO SEA
by Mary Cummings

Reviewed by Mrs. Kristin Bernacchi

Live through World War II on a submarine through the eyes of a 15 year old sailor. The author, Mary Cummings offers a unique story about family, friendship, war and surviving in a book geared towards teenagers. I found myself quite involved in the story relating it to today's sailors and how traditions carry on.

And the Baker's Boy Went to Sea offers a chance to read about World War II and life on a submarine. I enjoyed the characters and how they intertwined their traditions and cultures into eachothers, the day to day life on a submarine and the dangers and acts of courage our submariners lived through during World War II.

The story begins with a 15 year old boy looking for a way out of a miserable home life. Owen wants to join the Navy but at age 15 he knows it isn't possible. His friend helps him obtain a fake birth certificate to prove he is 17 and the story takes off.

Once accepted into the Navy he is assigned to a submarine, the newly commissioned USS MAKO. They suspect he is young but never question it in depth, the demand for sailors is too great. He is assigned to the galley, in charge of baking. All the characters learn through every experience that they must work together to make the boat successful, from the Captain down to the baker.

As he befriends many on the boat he becomes one of the guys. There is a lot of mentoring for the young sailor and he is very eager to learn. Owen is often given the chance to take on new responsibilities, he studies every chance he gets and is excited to be a part of the crew.

The descriptions of the battles between the Japanese and the submarines are quite intense. You can sense how scared they were yet showing bravery as every second passes, as every depth charge comes closer or hopes for the sound to be further away, a sigh of relief is heard.

The reality of the dangers of being a submariner are brought to life on these pages. The new experiences they had to be ready for at all times are endless. Being unable to surface for weeks at a time, the hot unbearable conditions and anxious moments to stay undetected reminds us how important submarines were during the war.

The story comes to it's peak as depth charges are being dropped on MAKO and the crew is prepared to die rather than be captured. Men willing to make the ultimate sacrifice for their country becomes very real. Our 15 year old sailor grows up in a hurry and never regrets his choice, he has become an American hero.

Being a submariner is built on tradition and Mary Cummings is able to bring the past and the present together. I could appreciate the story and the facts provided to explain certain situations and terminology. The descriptions of duty sections, steps to getting qualified, the importance of receiving one's *fish*, *eternal patrol*, what a *wolfpack* is and many other submarine terms help the young reader understand life aboard a submarine.

I would recommend this book as a gift to teens and tweens of submarine families to give them an idea of what their relatives, past and present, did and continue to do onboard submarines. It is an interesting read and a chance to learn about the day to day operations on a submarine during World War II and a unique opportunity to learn the secret language belonging to submariners.■

To order your copy of And the Baker's Boy Went to Sea please send payment and the necessary information to:
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THE GALLOPING GHOST
The Extraordinary Life of Submarine Legend Eugene Fluckey

By Carl LaVO
Naval Institute Press
Annapolis, 2007
ISBN-13: 978-1-59114-456-4

Reviewed by RADM Bruce B. Engelhardt, USN (Ret)

Medal of Honor awardee Admiral Eugene B. Fluckey's book, Thunder Below!, was first published in 1992. With its action packed narrative, its focus on the humanity and heroism of everyday submariners and through use of relevant *lessons learned* for modern-day submarine warriors, it set the standard for World War II submarine narratives. As a Commander, just finishing up my command tour, I had the privilege of reviewing Thunder Below! in THE SUBMARINE REVIEW's January 1993 edition. So, when I picked up this new biography of Admiral Fluckey, I could not help but say to myself, "How can anyone improve on this story, already told so well?"

Surprisingly, I found The Galloping Ghost to be full of fresh insights into the life and accomplishments of an American hero. In spite of the title, which could lead one to believe the book is solely focused on Fluckey's exploits on USS BARB, I found the book, in actuality, to highlight the man, Eugene Fluckey, and the philosophy by which he lived. Of course, because the five war-patrols on BARB so defined the man, LaVO describes their events in detail, but from a much more dispassionate point-of-view than the Admiral himself could.

The book is divided into three parts. Part One tells the story of Fluckey's formative years leading up to command on BARB. In it we learn about Eugene Fluckey's family heritage, with military service dating back to the revolutionary war. As the result of hearing a radio address by President Calvin Coolidge when he was a boy, we see the dawning of Fluckey's lifetime philosophy which emphasized persistence and determination. We also get a glimpse into his love for military history, science and engineering and we find that he honed his leadership and sense of self-reliance and adventure by

excelling in the Boy Scouts. We also learn how he overcame the typical hardships, disappointments, family separation and discouraging times of a junior officer.

Part Two is the still amazing story of Fluckey's command tour on the WWII submarine BARB. LaVO captures the heroic war patrols in a thoroughly researched, factual, yet fascinating narrative. An example of this narrative is outlined below as LaVO sets up the upcoming raid into Namkwan harbor, for which Fluckey would ultimately be awarded the Congressional Medal of Honor:

> "Fluckey radioed Captain Shepard of PICUDA inviting him to join the action. But he declined, thinking it was foolhardy and telling Fluckey to "drop dead!" The skipper was undeterred. Executive Officer Webster suggested handing out life jackets for the approach—just in case. The skipper thought it might frighten the men. He'd rather have them concentrate on the tasks ahead. He decided to address them over the intercom, to prepare them for what was to come. "Shipmates, we've got this convoy bottled up along the coast. We're going to find them and knock the socks off of them," he said. "This surprise will be BARB's greatest night, a night to remember. If you have any questions, I'm coming through the boat now.""

Part Three is the inspirational account of a man who did not rest on his laurels, but continued to contribute to his country and his shipmates with unabashed enthusiasm and a never-give-up attitude. We learn of his tour as COMSUBPAC where he showed his extraordinary vision and leadership as he helped lead the Submarine Force into the nuclear era. A big supporter of the speed and unlimited submerged endurance of nuclear submarines, Fluckey did not seem to exhibit the change resistance and "diesel boats forever" mentality of some. Later, we learn how he survived the brutal terrorist attack of his new headquarters in Spain, by showing no fear and pressing on with the repairs and opening the building as scheduled. LaVO also recounts the story of the dedicated servant leader in action as he headed-up the fund raising drive for the Memorial Stadium at his beloved Naval Academy. Behind all of this,

Fluckey's continuing respect and affection for his BARB crew shines through. He maintains close contact with them and pledges the royalties from Thunder Below! to go towards his former crew's reunions. He embarks upon a successful quest to prove that BARB's exploits in Namkwan really occurred as he reported. He ended up traveling back to China to secure his crew's legacy. LaVO tells us the story of a man who finished well.

LaVO's book is a respectful tribute to a hero. At the same time, it shines forth as a truthful and objective history of a man whose spirit of optimism and determination permeated everything he did. To the extent that being too proud and enthusiastic about his crew on BARB was a fault, LaVO certainly exposes Fluckey's weakness in that regard. In one passage, LaVO describes an event during Fluckey's time as COMSUBPAC when he and and his inspection team jump into the ocean and swim from a support ship onto the nuclear submarine PLUNGER, in order to accomplish an at-sea personnel transfer. Whether or not this action by the Admiral was foolhardy or exemplary is left to the reader. But in telling it, LaVO makes sure we understand that Fluckey was a man who believed in taking calculated risks to get the job done.

Without overreaching, Carl LaVO gives a page by page delineation of a man who accomplished great things without succumbing to cynicism or hardness of heart. By the end of the book, I found myself saying, along with Admiral Fluckey, "We don't have problems, just solutions."■

2008 REUNIONS

USS IREX SS-482 March 2008
Date and place TBD. (This for crew living in Florida).
POC: Al & Terry hahn, 93 North Granby Road, Granby CT 06035
e-mail: hahns@rcn.com

USS TRIGGER SS-564 April 14-18, 2008
Loc: the Holiday inn, Mt. Pleasant, SC
POC: Wayne Standerfer Phone: 972-298-8139
E-mail: 1waynes@charter.net Web Site: http://www.ss564.org

USS CAVALLA SS/SSK-244/SSN-684 April 25-26, 2008
Loc: Hawthorn Suites Hotel, 6300 Seawall Blvd., Galveston, TX
POC: J.J. King, Capt. USN(Ret.), second CO of SSN-684
Phone: 231-869-2344, Mail: Cavalla2008, PO Box 1046, Pentwater, MI 49449
E-mail: Cavalla2008@aol.com

USS BLUEFISH SS-222 & SSN-675 May 1-3, 2008
Loc: Embassy Suites, St. Louis/St. Charles, MO
Phone: 636-946-5544
POC: John Wittenstrom, RCM(SS) (Ret.) Phone: 910-944-7697 (work)
910-235-0191 (home) E-mail: john.wittenstrom@ncmail.net

USS FLASHER SSN-613 May 14-18, 2008
Loc: Ramada Hotel POC: Tuppy613@aol.com

USS CUSK SS-348 May 15-18, 2008
Loc: Charleston/Mt. Plesant, SC
POC: Greg Czech, Phone: 706-854-7816 E-mail: subman61@knology.net

USS SEGUNDO SS-398 May 18-22, 2008
Loc: Sands Regency Hotel
POC: Ken Owen E-mail: kenowen1@cox.net

USS CAIMAN SS-323 May 19-22, 2008
Loc: Lodge of the Ozarks, Branson, MO
POC: John A. Fagereng Phone: 7078-544-7903
E-mail: jaf9945@comcast.net
D.B. Frider E-mail: dbfrider@comcast.net
Web Site: http://www.flamincaiman.org

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Articles for this magazine will be accepted on any subject closely related to submarine matters. Article length should be no longer than 2500 to 3000 words. Subjects requiring longer treatment should be prepared in parts for sequential publication. Electronic submission is preferred with either MS Word or Word Perfect as acceptable systems. If paper copy is submitted, an accompanying 3.5"diskette will be of significant assistance. Content, timing and originality of thought are of first importance in the selection of articles for the **REVIEW**.

A stipend of up to $200.00 will be paid for each major article published. For shorter Reflections, Sea Stories, etc., $100.00 is usual. Book reviewers are awarded $52.00, which is that special figure to honor the U.S. submarines lost during World War II. Annually, three articles are selected for special recognition and an additional honorarium of up to $400.00 will be awarded to the authors. **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. In those instances where the NSL has taken and published an official position or view, specific reference to that fact will accompany the article.

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