

THE SUBMARINE REVIEW



JULY 2008

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EDITOR'S COMMENTS

Normally, each issue of THE SUBMARINE REVIEW headlines its FEATURES section at the front of the magazine. In this issue, however there are two special sections preceding the FEATURES.

From time-to-time we headline the Eulogies of famous submariners but in this case we have remembrances given at the memorial service for a young nuclear trained submarine officer. As part of his shore duty following a sea tour in a Trident missile boat, he was killed as an Individual Augmentee serving in the front lines of the War on Terror in Afghanistan.

The Submarine Technology Symposium in May gave us two important views of the Navy's Shipbuilding program. Ms Stiller, the Deputy Assistant SecNav for Ship Programs went over the programs, emphasizing submarines. Mr Ron O'Rourke, an astute observer of Navy programs for the Library of Congress, offered what he sees as problems with the Navy's planning for ship force structure. Both presentations are recommended reading for those concerned for the future.

The FEATURES section itself honors two submarines made famous during the Cold War era. VADM Jay Donnelly spoke at the 40th Anniversary of the loss of SCORPION. PARCHE was honored by the Hampton Roads Base of the US SubVets during their memorial service and the keynote speech was given by CAPT Bruce Smith, a former Commanding Officer of the boat. For those not familiar with PARCHE's most unusual record, CAPT Smith's speech will be most enlightening.

The ARTICLES in this July issue cover a good part of the waterfront of submarine interest. CAPT Ken Perry is the Commodore of SubDevRon TWELVE, a unique organization within the US Navy, and he gives us an excellent summary of all the work going on there in these modern times. The second article is the NSL Prize Winner from the Naval War College concerning a potential of UUVs which can be turned against our forces in Sea Denial. It's a concept we cannot afford to dismiss lightly. LCDR Ekin, an officer in the Turkish Navy, has an interesting discussion of nuclear submarines in Naval Diplomacy. The effect of that aspect of worldwide, front-line deployments is often lost on those who think the

non-violent persuasive use of naval force is limited to ships with obvious presence.

John Merrill has continued his efforts to bring the history of our technologies to our readers with his discussion of the control of radio comms in the WW I era. In addition, CDR John Alden has given us another excellent close examination of a WW II loss of a submarine. There are always *lessons-to-be-learned* from one of John's analyses of past incidents. The final article is from a FLASHER WW II war patrol, and it is in terms familiar to everyone who has been a skipper or an OOD underway in a submarine.

Jim Hay
Editor

FROM THE PRESIDENT

This has been a productive quarter for the NSL! VADM George Emery did another superb job as Chairman of the 2008 Submarine Technology Symposium (STS). George has agreed to chair STS 2009 and 2010.

ADM Eric Olson's remarks to the attendees at the STS Banquet challenged the Submarine Force to deliver a suitable vehicle at an affordable price to transport Special Forces personnel to the shore. Mr. Ron O'Rourke provided another thought-provoking analysis of the Navy's shipbuilding program. His remarks are in this issue. Commodore Ken Perry, COMSUBDEVRON 12, chaired the Fleet Needs session with four commanding officers reporting on their unique operations in the far corners of the world. The debrief of the first OHIO SSGN patrol was a crowd pleaser.

The 2008 History Symposium was the seventh in the series. *"50 Years Under The Ice,"* was a timely topic. The event was co-sponsored by NSL, Naval Historical Center and Navy Historical Foundation. Speakers included VADM Ken Carr, a USS NAUTILUS plank owner and on the first polar transit. CAPT Merrill Dorman provided an overview of Arctic Operations from the scientific perspective. CAPT Bob Perry provided an outstanding operational report from his experience as the former Commanding Officer, USS HAWKBILL (SSN 666) on two Arctic deployments. CAPT George Newton moderated the seminar. RADM Jerry Holland continues to manage the program for this well-attended seminar. The seminar was sponsored by Northrop Grumman Corporation Marine Systems Division.

The League's next major event is the Annual Symposium, 22-23 October 2008 at the Hilton McLean at Tysons Corner. This year N87 and NSL combined the Washington, DC area Fall Submarine Cocktail Party and the Submarine Social event on Wednesday, 22 October 2008. Look for your registration package in August. We will have registration information on the league website, www.navalsubleague.com, including a tentative agenda.

The website is supported by Raytheon Company in updating the information on the splash page on a regular basis. This allows us to insert submarine news articles in a timely manner. Through the website you have access to addresses for over 20,000 submariners.

Tim VeArd of VeArd Computer Research, Inc. provides a valuable resource for the League including membership and website support for numerous ships and organizations including NSL Chapters.

This year the NSL experienced increased costs in all phases of League operations. That coupled with reduced income resulted in a loss for the fiscal year. I initiated an aggressive campaign requesting annual donations to the League to close the gap. I am pleased to report that your response has been most encouraging.

The League continues to address issues that are important to the Submarine Force. Your support of increasing the build rate for VIRGINIA Class submarines to two submarines each year has had impact. This year the Navy will focus on the replacement platform for the nation's strategic deterrent capability. I ask that you also take an active interest in ensuring that the submarine remains the preferred platform for this program.

A personal experience in July gave Jan and me a personal view of the price being paid by our young sailors and marines and their families in Afghanistan and Iraq. I was a patient at Bethesda. The other end of the passageway was occupied by seriously injured service members. I was struck by their courage and youth. The young wives and toddlers tugged at your heartstrings. Bethesda is doing a great job. This great country must do better taking care of the wounded once they leave uniform.

Please join Jan and me as we continue to pray for the safety of troops and submariners deployed around the world. I am honored to represent you as President of the Naval Submarine League. Enjoy your summer.

J. Guy Reynolds
Vice Admiral, USN (Retired)
President



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EULOGIES for an IA SUBMARINE OFFICER

**MEMORIAL SERVICE FOR
LT. JEFF AMMON
REMARKS BY
RDML JAMES SYMONDS, USN
COMMANDER, NAVY REGION NORTHWEST
JUNE 4, 2008**

Peace does not preserve itself, freedom is not free. The work of building a better tomorrow for all humanity entails sacrifice.

Tragically, that sacrifice has touched the Northwest Navy family. We lost a shipmate, and a friend...a Sailor working to preserve peace, to build a better tomorrow for the people of Afghanistan, and for the people of America.

President Kennedy said, "A nation reveals itself not only by the men it produces but also by the men it honors, the men it remembers." Today we're here to honor and remember Lieutenant Jeff Ammon. Many have inquired since his death why a submarine officer was serving in the mountains of Afghanistan. The answer is that Lt. Ammon was an officer in the United States Navy. A resourceful, flexible, and dedicated member of our Armed Forces, serving where it pleased the Navy to send him.*

*Editor's Note: Individual Augmentees are one of the Navy's means of supporting the Global War on Terror by supplementing other services with Navy skill sets, primarily ashore. In contrast to a Sailor that deploys with a ship, squadron or unit, a Sailor who leaves their assigned command to deploy individually or with a small group is known as an Individual Augmentee (IA). IAs also include Reservists deployed individually or with a unit. Half of the deployed IAs are active duty and half are mobilized Reservists. Most are concentrated in the Central Command region, which includes Iraq, Afghanistan, Kuwait, Bahrain and the Horn of Africa. The rest are serving elsewhere in the world.

There are approximately 10,000 Navy personnel currently serving in an IA capacity.

Jeff enlisted in the Navy in 1988... the biggest threat to America's future was the Soviet Union, and as a submariner, Jeff was on the frontlines of the Cold War.

But now, our country, and our very civilization, are now threatened less by conquering states than we are by failing states.

The skills, talent, and dedication that Sailors used to help win the Cold War are needed now to win the war against these new threats... and sometimes, those frontlines are a long way from the water.

Failed states are a major threat, and bombs and bullets aren't always the best weapons we have to fight and save them. Lives and whole societies must be rebuilt and enhanced ... decades of violence and oppression overcome... we have to connect those societies with the rest of the World. It's a long, difficult job, and it's the job that Lt. Ammon, like so many of our Sailors, volunteered to do.

The historian Stephen Ambrose has written about America's citizen soldiers of World War II. He said, "they knew the difference between right and wrong, and they were unwilling to live in a world where wrong triumphed, and so they fought and they won, and we and all succeeding generations are the eternal beneficiaries of their sacrifice."

Those characteristics are not unique to the World War II generation... they are just as applicable to today's military members, and certainly applicable to people like Jeff Ammon. His emails home reveal much about his feelings towards his mission in Afghanistan.

"The people in this region will be successful in the future... you could just see it," he wrote. "You can only make so much difference in the short time you have over here.... But the kids are the ones that will benefit."

Afghans and Americans will be eternal beneficiaries of Jeff's service and sacrifice. But we are not just the *beneficiaries* of his sacrifice, we are also its *stewards*.

While today we remember and reflect on his life and of his loss, we should also keep in mind the meaning of his sacrifice. Freedom, opportunity and prosperity are precious blessings; they were not left

to us in perpetuity, they were not gained without great sacrifice, and they will not be preserved without purpose and without valor. Jeff was working with purpose, working with valor, to maintain those things we hold most precious, and to give them as a gift to a nation not his own.

Every American who gave his or her life for our country was, in one way or another, a victim of a peace that faltered... We know that if diplomacy is not backed by real and credible threats of force, it can be empty, and even dangerous.

As members of the armed forces of the United States of America, and stewards of Jeff's sacrifice, we have an unending obligation to stay strong, to keep deterring war when we can, and fight when we must, and to use the power given us to make a better world for our children and the children of the world.

Through Jeff's career his family has provided a great service to our Navy, our Nation, and the world. And now they have shared terribly in the sacrifice Jeff was called to make. We can never come close to adequately expressing our thanks, but they should know they have the eternal gratitude of everyone gathered here today.

Thank you all for coming to honor LT Jeff Ammon and his family.■

MEMORIAL SERVICE FOR
SHIPMATE LT JEFF AMMON
JUNE 4, 2008

*by CDR Ken Fontes, USN(Ret.)
Former Commanding Officer, USS ALABAMA*

I feel that my charter today is to celebrate the life of our friend and shipmate Jeff Ammon. I had the privilege of being his CO on ALABAMA just a few years ago. I like to describe the atmosphere on ALABAMA as a family atmosphere and Jeff was an integral part of making the ship and the family atmosphere a big success!

But first just a few housekeeping items:

Last Friday evening my son, who routinely corresponds with Jeff's son, woke me up and handed me the phone and asked me if I would speak with Mrs. Ammon. I said yes, gave my greetings to Gayle and she immediately said "I would be honored if you would speak at Jeff's memorial service". I, of course, said yes. Now that I am fully awake I would like to say that being given the opportunity to celebrate the Life of Jeff Ammon in front of his family, his shipmates and colleagues is the highest honor anyone has ever given to me. I pray that I can deliver a tribute worthy of Jeff. I will cherish this opportunity for the rest of my life.

Jeff had lived an amazing life even though it was cut short. He was a great friend and he was the kind of friend that stands by you when you need somebody to be there. Jeff routinely displayed a relentless and upbeat attitude. He was always a shipmate and he never complained about helping out a fellow shipmate. As his CO I recall that he was always prepared to execute the complex evolutions for his upcoming watch. He always exercised the utmost patience and respect toward individuals in his division, watch section and his under instruction watches. Also, I have absolutely no recollection of him ever getting mad. Whenever he called me as Officer of the Deck or Duty officer he always made me feel that he had everything well under control, and I even recall that his voice had a calming influence for me during those many reports and discussions.

The other night I was reviewing his e-mails from the Gulf, they were all typical Jeff Ammon, light hearted, positive and upbeat. I will definitely keep those cherished e-mails from Jeff for the rest of my life.

I can recall that his colleagues could always count on him. He was the one watch officer that could be depended on for a watch relief, and more importantly, he was always ready to relive the watch on time.

He had an eternally optimistic attitude, even when times were tough. I'd bet he'd want us to do the same under these present circumstances. He started the often used term in the Wardroom of *shipmate*, this was a term that helped loosen up the often overbearing seriousness of the job and helped keep us all upbeat. The first time I heard the term *shipmate* used in an endearing manner like this was after a particularly difficult engine room casualty fire drill, another highly respected submariner, shipmate Cizin was describing how badly the drill was going and none of the designated personnel were in the right place or with the right equipment and nothing was going right when Shipmate Ammon showed up with the desperately needed damage control gear just in time to put out the fire and make the drill a success.

Jeff's death was sudden. I remember when I heard the news I simply could not believe it. Jeff was too young but as it slowly occurred to me I have realized that Jeff indeed lived his life wonderfully. Jeff was well-loved and he had done so many good things on earth and had touched the lives of his shipmates and family in so many positive ways. I will forever be grateful to have known and worked alongside Jeff. I will forever be grateful that Jeff was there at the right place and at the right time so many times on ALABAMA. I will forever be grateful for spending those few years of my life with a friend and shipmate like him. All the memories I have shared with him and our ALABAMA family will forever be cherished and remembered. Jeff will forever live in my heart... In our hearts.

This is not the time for us to grieve his death but it's our time to celebrate his life. Don't ever forget Jeff. He wanted to do the best job possible while enjoying his work with his shipmates. So at this moment let's all think back and remember how Jeff touched our lives. How he made us laugh and how good Jeff was as a person, a

husband, a father and a shipmate. This is not the moment for us to shed our tears but we should all be thankful that we were given the chance to have known our friend Jeff Ammon.

I don't think anyone can memorialize him better than the shipmates that served with him. Here are just a few of the postings I found from ALABAMA shipmates on the Kitsap Sun Website:

I served with Jeff for almost 3 years on USS ALABAMA. He was universally respected and liked. He was a great officer and friend. I have not one negative memory of him; he was a great guy, and an example of our finest. His sacrifice is a very close and personal reminder of what Memorial Day is really about. He and his family have made a sacrifice for our freedoms that we can never repay. Please keep his family in your thoughts and prayers. He was a very devoted family man and Naval Officer.

And this one from a very squared away LDO:

I did serve with Jeff back on the good ship ALABAMA. We were a tight family from the wardroom, to the Chief's Quarters to the entire crew. LT Ammon was a fine example of a Naval Officer. He was well liked by everyone onboard. He was a professional, one of the best. He personally taught me a lot about driving a submarine. I will never forget Halo while underway. You will be missed my friend. Fair Winds and Following Seas.

From our Weps:

We can never repay for the loss of people like Jeff, he made the ultimate sacrifice on the front lines defending us, and helping to bring freedom and prosperity to others. We should continue to take up that cause in honor of his sacrifice.

May You Rest in Peace LT! Thank you for serving our country. A true HERO has been lost!

There are many other wonderful personal statements about the memory of Jeff at the Kitsap Sun website, I encourage you take the time to look at them.

Finally, just this morning I got this e-mail from our ENG:

I am unable to attend, but just wanted to pass my sincere condolences to the Ammon family. Jeff and I shared a state-room during our ORSE run in which he also served as the

CRA. He was a true professional and provided the kind of leadership to his division that was contagious to the other divisions and JOs. Our department was significantly better because of his leadership, even-keeled outlook, and mature attitude. I truly relied on Jeff for his experience and can-do attitude and he was a true shipmate. Again, I can't express my condolences enough for Gayle and the children. Jeff was a true warrior and I think he touched each of us during our time with him and I know that the Army personnel and the Afghan people that he interacted with would agree. He will be deeply missed. I hope his memory is echoed for he is a true patriot that gave his life for our country. God Bless him and his family. By the way, he also recalled the Nagahyde story in his e-mail!

I recall a memorable moment in the HBO TV series Band of Brothers, when, Dick Winters, the phenomenal CO of the now world famous Easy Company was sharing a moment with his grandson. The grandson asked him "Grandpa were you a hero during WWII", he said "no, but I served with a company of heroes". Many times I have told my new Caterpillar family that I served with an entire boat of heroes. Our Shipmate Jeff Ammon tops that list!

I will close with a quote that I recently found quite by accident while looking for leadership tidbits to inflict on my Caterpillar colleagues. It is from one of our greatest military leaders who was extremely effective at minimizing his troops combat losses. Also I would remind you that his troops were confident in his leadership and they would follow him anywhere:

"It is almost foolish and wrong to mourn these men who died. Rather we should thank God that such men lived."

---General George S. Patton Jr.

God bless Jeff Ammon and his family
God bless our great navy and our extended family on USS
ALABAMA
God bless the United States.■

MEMORIAL SERVICE FOR LT JEFF AMMON**by CDR Scott Cooledge, USN**

Former Commanding Officer, Joint Force Interagency
Provincial Reconstruction Team, Ghazni, Afghanistan

CDR Cooledge is a native of Portland Maine and a 1985 graduate of Maine Maritime Academy. He earned his Bachelor of Science Degree in Nautical Science and his United States Coast Guard Mates License Unlimited Tonnage all Oceans. After a year of working in the merchant fleet CDR Cooledge attended Aviation Officer Candidate School and was commissioned an Ensign in July of 1986. He then attended flight training and was designated a Naval Flight Officer in September 1987. After his first tour he was selected for a pilot transition and after completing Pilot Training was designated a Naval Aviator in August 1991.

In May 2005 CDR Cooledge reported to Patrol Squadron Forty-Six as the Executive Officer, assuming command of the Gray Knights in May 2006 and immediately deploying to a split-site Kadena-Misawa Japan deployment.

In March 2007 CDR Cooledge assumed Command of a Joint Force Interagency Provincial Reconstruction Team covering Ghazni Afghanistan where he was responsible for Security, Reconstruction and Governance. For one year CDR Cooledge and his team operated from a forward operating base in the volatile southeastern region of Afghanistan conducting over 500 Ground Assault Convoys into Afghanistan's fifth largest province. For his actions CDR Cooledge was awarded the Bronze Star as well as the Army Combat Action Badge. In Feb of 07 CDR Cooledge was selected for Captain, in August he begins National War College.

I would like to start by thanking the family for allowing me to be a part of today's memorial and also thank the entire staff here at the region who worked so hard to get me out here to be part of this day, your organization's tremendous support of Jeff's family over the past couple weeks has been superb. I will tell you it was always something we all worried about over there, how our wives and children would be handled by our units back at home if we

didn't make it back. The notification, the follow up care, the ceremonies; from what I have seen so far Jeff would be very pleased with how his loved ones have been looked after by his Navy family here at home.

Before I get started I would like to recognize another member of my team that is here with us today, LT John Gildea, John was my other engineer on the team and Jeff's counterpart and close friend. John is a Seabee and was awarded a purple heart and a bronze star for his service in Afghanistan. A reservist, he left a high paying job with Intel Corporation to serve for a year in Afghanistan.

He survived an IED strike on his vehicle that took the life of another one of our team mates. He made the trip up from California to honor Jeff. John I want to thank you for coming and thank you for your service.

What a tremendous honor to be able to stand up here today before you all, dressed in the cloth of my country, in the presence of like minded men and women and pay tribute to my friend and comrade LT Jeff Ammon. So what is my role here today; well for 16 months I was Jeff's Commanding Officer on the ground in Afghanistan, so I am uniquely qualified to tell you all about the final year and a half of Jeff's life. I first met this young man in early January 2007 when he came into my tent at Fort Bragg asking if he could join our team. Our unit's engineer that had been ordered in was a no show at the start of training and Jeff was on the alternate list still not yet scheduled to deploy with a team. Now while some of Jeff's counterparts were actively searching for ways to be sent home and get out of doing their duty, Jeff was busy going tent to tent aggressively lobbying the various teams commanding officers looking for a way to go on mission and do his duty. Needless to say I immediately loved his enthusiasm and wanted a man like him on my team, we got him moved into our tent and on our team that night. Over the next 3 months we trained together and lived together at Bragg, 18 men to a tent, eating MRE's, a weekly cold shower and no liberty. The woods of North Carolina were a horrible place but it was necessary to get us ready to go to war. In late March with very little fanfare we climbed aboard our aircraft as one unit and departed on what would become the defining year in most of our lives, a year spent providing freedom and a better life for hundreds of thousands of Afghans.

The Jeff Ammon you all knew in many ways is probably not the same man I served with over in the battlespace. I know this to be true because I watched all my men change over the course of the year. Afghanistan does that to you, it gets inside you and affects you deeply. When you spend a year of your life in the most devastated place on earth with some of the most vulnerable, at-risk people on our planet it changes you. I will do my best today to articulate to you just who and what Jeff was to the Afghan people and to his teammates. I will also try and describe what a small group of Navy guys were doing over there on the ground, what Jeff's mission was and how he contributed to the counterinsurgency plan we were executing in Ghazni province. I will attempt to explain why I think Jeff chose to extend and remain behind for a second tour of duty. And finally I will describe to you some of the bonds that Jeff experienced both with his fellow soldiers and sailors and with the Afghan people, bonds that held us all together and drew Jeff to remain behind when we all left in late March.

The bonds that are formed in small unit combat arms teams are remarkable and truly must be lived to be understood. For those who have never experienced these emotions they are difficult to understand. I could stand up here for hours and not be able to thoroughly explain to you what it meant to Jeff to serve beside like minded men under arduous conditions out in the field in southern Afghanistan. But needless to say he absolutely loved it and we loved him.

The mission of our unit was to provide for the security reconstruction and governance of Ghazni province, an area roughly the size of Maryland populated by about one and a half million people. Ghazni is located in the southeastern region of the country between Kandahar and Kabul smack in the middle of some of the worst fighting in Afghanistan. We were a joint team made up of Navy, Army, National Guard and Civilians. We had the responsibility of a battalion, some would even say a brigade but the force structure of only a platoon, what we lacked in firepower and manpower we made up for with naval power. My dirt sailors performed brilliantly under some of the worst conditions any sailor will ever be asked to serve in. Completely out of their element, they were fearless, they were tireless and they made our Navy proud every day. On any given day on a typical mission I would find myself rolling down a

wadi in my Humvee in the middle of nowhere with ABE3 Boyle off the ROOSEVELT, a part time rodeo clown as my driver, ET2 Obrien out of NAS Jacksonville my gunner on the 50 CAL, sitting behind me cracking jokes MA2 Cuccaro on his third IA doubling as my intel officer and personal security detachment and my submariner LT Jeff Ammon beside him riding dismount and directing the engineering mission. That's a typical day in Ghazni, 5 Navy guys rolling down the backroads of Afghanistan with nothing but a GPS and a few small arms hanging it out there creating freedom and spreading democracy where it never before existed; it was an incredible experience for us all, it is what Jeff loved so much and it is why he stayed.

Jeff held multiple positions in my unit, he was my PPO and contract officer responsible for managing all coalition force contracts in Ghazni with over 200 million in reconstruction underway. Schools, hospitals, roads, you name it and Jeff built it. He was also my field engineer who did the quality control inspections on those projects, additionally he managed all the local nationals who worked for the PRT and finally and most importantly he was a statesman for the US government and an infantryman in the 82nd airborne always ready to run and gun on any mission. Like all my men he earned an 82nd airborne combat patch that he wore on his shoulder and an army combat action badge on his chest. For the past year he was an American Soldier and Statesman.

A typical day for Jeff would see him meet with 3 or 4 local national contractors in the morning, bid negotiate and sign million dollar contracts. He would then gear up and climb into a humvee and roll out the gate on an 8 hour mission into Indian country working on governance, security and reconstruction. When he got home he would then change into his favorite traditional Afghan clothing and spend his evening resolving disputes between the local national employees that he managed. I cannot tell you the number of times I would catch Jeff wandering through our base in flipflops and some kind of traditional Afghan dress with 3 days of growth on his face, a cup of tea in his hand, doing business with the locals. Military bearing was not his specialty or something he cared much about and he loved to challenge authority whenever he could. My XO, an old school Army officer came to me more than once with

his concerns that Jeff had *gone native*. I used to just laugh and smile and tell the XO we needed to just let Jeff be Jeff, because after all he was getting it done and the locals absolutely loved him. Jeff gave the Sgt. Major fits and he loved to pull my chain and see how far he could push both of us on uniform and grooming standards. For those of you old enough to remember the show MASH, Jeff was my Hawkeye Pierce. And we all know what a good man Hawkeye was.

At the end of his typical day Jeff would love to enjoy a good smoke, cigars became a passion for Jeff while we were in country. He bought himself a new humidor online that he was extremely proud of. He filled it with what he thought were good cigars, of course his definition of a fine cigar differed greatly from mine but that's another story. Almost every night Jeff, big daddy, JP and John along with me would sit under the stars behind our hoochies, smoke cigars and discuss the day's missions and talk about loved ones at home, talk about what we missed most and how lucky we were to be together. It was one of our few enjoyments and one of our favorite things to do.

When we weren't smoking our cigars Jeff and I logged dozens of missions and hundreds of miles together in the battlespace but one mission in particular sticks out in my mind and defines the good that Jeff was doing in country. We had to go into a village that on the night before was the scene of a pretty bad gunfight between the Taliban and some of our special forces. During the course of that firefight there were some civilian casualties and some pretty extensive property damage in the village. Our job was to get into the village in the morning and assess the damage, treat the injured and negotiate compensation with the village elders. The bottom line was we were there to clean up the mess. As we entered the village the people were decidedly angry with coalition forces. As my men set up a security perimeter Jeff leaned right into it and began doing what he did best, making friends. Over the next 4 hours I watched Jeff go house to house, treating the wounded, meticulously recording any damages and most importantly, creating relationships, holding babies, putting his arms around the shoulders of shell shocked villagers and using his amazing talents to convince an entire village that despite the previous nights events we were not the enemy. He quite simply displayed the compassion of a great

nation to that village. It is young officers like Jeff that are out there every day implementing US foreign policy in tiny villages across the globe that determine how the rest of the world views us, and their success or failure will be the deciding factor in this global struggle for the hearts and minds of entire populations. I can tell you the compassion that Jeff showed the Afghan people on a daily basis was sincere and never put on, they sensed his genuine concern for their worth and human dignity and always responded in kind. Jeff had more Afghan friends than any member of my team.

Today our nation is at war yet less than .1 percent of the population will ever serve in the military. Of those who do serve less than 10 percent of those will ever actually gear up, pick up a weapon, lock and load, and go eye to eye with our nations enemies. To stand within arms reach of those who hate us and want to kill us, to go forward into some of the harshest terrain on this planet and endure daily hardships and risks that are unthinkable to most Americans. In the end the real burden of defending this nation falls to a very small elite heroic group of men like Jeff Ammon. Men who understand that someone must go. Someone must raise their hand and say "Send me, I'll do it, I'll go." And in Jeff's case to say "I'll do it again." I want you all to think about that for a moment—about the courage and commitment it takes for a man to raise his hand and say send me into battle, I'll go. Never mind the kind of courage it takes to say "I'll do it again" as Jeff did when he extended for a second tour.

One night over cigars and one of our informal counseling sessions Jeff and I talked about how fortunate we were to be forward defending our nation, to be able to experience the brotherhood of small unit combat arms while defending the worth and human dignity of an entire population and despite the hardships and the separation from our families we agreed that we were right where we wanted to be even if it all ended on the next days mission, no regrets. Jeff had no regrets because he had learned as we all had that even one day spent as a lion was far better than a lifetime lived as a lamb. For 400 plus days Jeff Ammon lived as a lion. In his time in Ghazni Jeff had logged dozens and dozens of ground assault convoys into some of the most dangerous terrain in Southern Afghanistan. On the day he died he was in the rear seat of the lead vehicle in his convoy. Now in any convoy every seat is a

dangerous one, but the rear seat of the lead vehicle is without a doubt the most dangerous place in the convoy. You see the lead vehicle is the one most apt to set off a pressure plate IED, the weapon of choice of the Taliban in Ghazni and what we got hit with most. The rear seats in any Humvee are the most vulnerable because you don't have the engine block in front of you to absorb the blast. Jeff knew all this and as a senior leader in the unit could have easily mounted up in a vehicle in the rear, in the front seat. But that wasn't Jeff. Jeff was a selfless leader who always went first taking the danger head on so others didn't have to. That's why he volunteered for every single mission that rolled out the gate, that's why he was in the lead vehicle and that's why he stayed for a second tour. So someone else didn't have to do it. Imagine it, a submarine officer wrapped in kevlar, it's a 120 degrees, he's loaded down with 50 pounds of weapons and gear strapped into a Humvee in the most dangerous position in the convoy, in one of the most volatile regions in the war on terror and he was saying, "Give me some more, let me go first, send me, I'll do it again..." think about that, that's a lion, ladies and gentlemen, that's a man who lived for 400 days as a lion. We should all be so fortunate.

For those of you here today who have yet to walk into your bosses office and volunteer for the next hard IA, let Jeff's courage be a reminder of who and what we are and what our obligations are in this war. Let Jeff's honor courage and commitment be the standard we all strive to live up to.

There were 5 of us who sat under those stars every night smoking cigars, 2 of them are gone. For those of us left the loss is almost too much to bear. Today I stand here and try to make sense of it all and in 2 weeks I will travel to Nevada to do it again and scatter the ashes of another one of our team mates. I'm not sure where we find these men, men like Jeff Ammon and Tom Stefani, but I do know as a nation we are fortunate to have men amongst us who clearly understand their obligation and are brave enough to act on that understanding.

Jeff, Tom, we miss you, we honor you and we understand you. Your brothers on the team will never forget you. We pledge to live up to the standard you have set for us, to live our lives as lions. We love you and miss you both dearly.■

VIEWS ON SHIPBUILDING AT SUBTECH SYMPOSIUM**2008 SUBMARINE TECHNOLOGY SYMPOSIUM****14 MAY 2008****REMARKS BY MS. ALLISON STILLER
DEPUTY ASSISTANT SECRETARY OF THE NAVY
FOR SHIP PROGRAMS**

Good morning. It is indeed an honor for me to be here this morning to discuss with you the Navy's FY09 shipbuilding plan, future submarine efforts, and how you can contribute to our future Navy.

Let me start with the 2009 President's Budget that was submitted to Congress in February of this year. This budget includes funding for seven new construction ships valued at \$12.4B. And for the first time in a long while there are no lead ships in the budget. The seven ships include 2 LCS vessels, one DDG 1000, one VA Class submarine, two TAKEs, and the Navy's first Joint High Speed Vessel. As you know the authorizers have marked and these marks in some cases do not support the President's Budget submission. So we have some work to do with the Congress over the next several months.

The Navy faces many challenges in procuring a force that will be effective over the broad spectrum of naval missions anticipated in the coming decades. We must procure ships in the most efficient and cost effective manner possible. The 30-year shipbuilding plan reflects the capabilities needed to meet the challenges the nation faces with a manageable degree of risk. As CNO has stated, the 313-ship force structure represents a floor—the minimum number of ships the Navy should maintain in its inventory to provide the global reach and persistent presence expected of Naval forces. Our PB 09 budget reflects the best balance of resources to execute our requirements.

Specific to submarines, in PB 09 the Navy is requesting \$2.1B of full funding for one Virginia Class submarine in FY09 and advance procurement for the FY10 boat and advance procurement for 2 boats in FY11. The Virginia Class construction program is

continuing to make progress towards realizing CNO's goal of buying two Virginia submarines for \$4B as measured in FY 2005 dollars, starting in FY 2012. With Congressional support of the addition of Advanced Procurement funding of \$588M in FY08, the Navy has accelerated the production of two Virginia Class Submarines per year forward from FY 2012 to FY 2011.

While press coverage tends to focus on the challenges in shipbuilding, there *really* is good news to report. The Navy and Industry shipbuilding team accomplished a great deal in the last year. We commissioned 5 ships into service, christened an additional 6 ships, and returned the last 2 SSGNs to the fleet. My office spends considerable time managing our shipbuilding programs in a portfolio manner. Over the last year, we've rebaselined contracts for those ships affected by Hurricane Katrina and awarded 6 contracts, under special authority granted by Congress to pay for infrastructure improvements to the shipyards on the Gulf Coast impacted by the hurricane. We've also restructured the LCS program; we're in negotiations for the lead CVN 21 and the next VA Class Multiyear; and we've awarded contracts for the dual lead DDG 1000 class ships.

Specifically within the submarine programs, the Navy has seen great progress. As I mentioned earlier, two SSGNs were "Returned to the Fleet" following their conversions and overhauls. The SSGN Program Office was recently presented with the Packard Award for Acquisition Excellence recognizing outstanding efforts. We're coming through the Reliability Improvement Program for ASDS. And SRDRS has been certified and will participate in an international exercise later this month.

Also last year we saw the commissioning of USS HAWAII, christening of NORTH CAROLINA, and keel laying of NEW HAMPSHIRE.

This year promises to be just as busy. In April 2008 we held a keel laying ceremony for NEW MEXICO. On May 3rd we commissioned USS NORTH CAROLINA, in June we will christen NEW HAMPSHIRE and commission her in October 2008, and we'll christen NEW MEXICO in December. So this year we plan to christen two submarines and for the first time in a long time we will commission 2 submarines in a single year. This is good news! The VA Class Program entered into OPEVAL last month. This is the

largest test program for the Navy, as all seven mission areas for the VA Class will be tested during OPEVAL.

As you know, for the Virginia Class, the procurement of two submarines a year by Fiscal Year 2012 is dependant upon the unit cost per submarine being less than 2 billion dollars as measured in 05 dollars. The Program Office is continuing to address the five areas that were identified previously to achieve the remaining cost savings. First, the shipbuilding team must continue to work to maximize efficiencies. Second, the Navy must refrain from making requirements changes to the VIRGINIA Class design. Requirements creep can add significantly to the cost of any program. Third, the Navy and the shipbuilders must continue investing in producibility improvements through the capital expenditure funds set aside in the current Multi-Year Procurement contract. Fourth, the Navy is investing in design changes that will make the submarines more producible, and therefore less costly to build. These design changes **must** have measurable returns on investment. Finally, the Navy is exploring the option of purchasing materials on a *portfolio* basis, rather than separately for each acquisition program. This area is broader than submarines. Potential savings come in the form of economic order quantity purchases, regional savings, and commercial leverage. This would potentially allow the Navy to reduce the shipbuilding costs associated with material, which accounts for an average of 57% of the annual shipbuilding budget. These actions will help the Navy achieve the \$2B per boat target.

The Navy also has a number of other cost reduction initiatives and processes in place to capture commonality benefits for the Current Navy and the Next Navy. These initiatives focus at the ship level, the system level, the material level, and on processes. For instance, in the Current Navy, commonality is enhanced through commodity contracts across multiple platforms; parts commonality; common processing and display systems; modularity; Open Architecture; and software reuse. An example of commodity contract is the recently awarded contracts by NAVICP for valves, one of the five highest volume commodities for the Navy. Five top valves representing ~ 35% of valve installations were placed on commodity contracts earlier this year. This type of commodity buy also helps to reduce the large number of suppliers currently in use

and ensures the Navy is getting the best value for our dollars. While this action addresses the in-service aspect of driving to commonality, we are also actively invoking the common parts catalogue in our new construction contracts. This common parts catalogue is a critical step in an effort to tackle HM&E standardization. Historically, the Navy affects an average of 360,000 HM&E equipment installations per year which represents a range of 37,000 pieces of unique gear. On surface ships we've recently agreed to go to a common door configuration. We continue to work these common parts on a daily basis.

We plan to increase commonality for the Next Navy by reducing the number of ship types; utilizing existing Navy systems on new designs; using adaptive infrastructures to allow technology to evolve without a physical impact to the ship; leveraging commercial technology; increasing modularity; increasing Open Architecture; adopting Class Common Equipment; and developing a common specification for an integrated product data environment. The goal of all these initiatives is to minimize variance within the systems to reduce cost, schedule, and risk. Overall, the Navy is moving towards a warfighting capability-based approach rather than platform-centric approach. This means that Navy develops specific capability and functionality for use Enterprise-wide vice expending additional resources developing multiple systems that provide the same capability but are targeted to only one class of ships.

For the Next Navy, Test and Evaluation savings could also be realized if common products were tested once vice on every platform. The Navy has devised an Enterprise Test and Evaluation strategy to eliminate redundant testing of common systems that is being implemented today. Simulated design analysis on VA Class eliminated the need for actual Shock Trials—saving \$70M. I believe the T&E area is rich for cost reduction efforts.

Commonality is also driving the use of open systems architecture and modularity. The Navy plans to reduce the number of surface ship combat systems baselines from sixteen to five by 2025 through open architecture. The ARCI model is often held up as the model to explore. And it has been a great model—we need to continue to refine it and challenge the way we do business to ensure we continue to realize savings.

Finally, the Next Navy can address commonality through ship design processes. We need to consider standard design tool interfaces such as implementing a CAD interface and keeping the end in mind as we develop technology, being mindful of not just producibility or acquisition cost, but Life Cycle Cost as well.

There are potential design opportunities on the horizon. Together with OSD and SOCOM, we have conducted an Alternative Material Solution Analysis, AMSA, to fill the capability gap because there is only one ASDS. The AMSA (similar to an AoA) is complete but the decision on how to proceed is still pending.

Another effort started this year is the planning for the Sea Based Strategic Deterrent (SBSD). The requirements for this effort are currently approved by CNO, and will be presented to the JROC in the next few months. The AoA will start later this year. And I'll probably be the only speaker to say that a submarine delivered capability is only one of the capabilities being considered.

The Underwater Launch Missile System (ULMS) effort is integral to Sea Base Strategic Deterrent. Design efforts are being discussed with United Kingdom Royal Navy to coincide with their need to replace their VANGUARD class submarines.

So you may be wondering—so what does she want from the submarine technology community. I want you to be cognizant of all the activity that is going on today and to understand how we are positioning ourselves for the future. As technologies are being developed for future and current applications it is imperative that you understand the cost implications of developing, fielding, and maintaining these technologies. There must be a compelling business case for every technology considered as part of the VA Class Block III design, the Sea Based Strategic Deterrent, or in planning on the son of VA Class. Understanding the cost implications is vital in moving forward. I'm not saying that the Navy won't make investments in technologies that give us a technological edge or fill a warfighting gap but I am saying that the costs of any new technology must be clearly understood. And developing technology that is on the cusp of transitioning, yet never does, must be watched. In the words of the great singer, Kenny Rogers, "know when to fold 'em, know when to walk away, and know when to run." Don't be afraid of saying "this is good technology but there are no near term applications." We can always document the work

done to date and revisit at a later time. As you develop technology, don't live in isolation. Understand the needs of the surface side of our Navy and see if technologies can be leveraged—I know they can. In fact, the AC plants developed for VA Class are scaled up and being installed on LHA 6 and DDG 1000. The fact the Navy didn't have to invest three times is a good thing! And where possible, understand international technologies. I understand you live in a world of NOFORN but we live in a global environment and there are international applications that may be attractive.

There is a considerable amount of R&D devoted to submarine technologies. In the FY09 budget there is over \$490M set aside for Team Sub R&D efforts and over \$60M in ONR funding for submarine technologies. We need to ensure that the correct technologies are being pursued and resource them properly. If you haven't figured out yet—I'm very conscious about the dollars. In this resource constrained world we must be vigilant.

There are some on-going submarine initiatives that are allowing the Navy to be better positioned for the future. The **TANGO BRAVO** initiative is demonstrating the feasibility of technology concepts that reduce costs while maintaining the current capability of the VIRGINIA Class submarines. Three concepts currently being evaluated are shaftless propulsion, external weapons, and a broader use of electric actuators. These evaluations are on track to produce measurable results and future savings once implemented.

This is an exciting time for submarine programs. Sea Base Strategic Deterent may enable current Tango Bravo and other R&D efforts to enhance the future submarine fleet.

It is a dynamic time in Navy shipbuilding. We have a lot of new surface ship and submarine designs on the drawing board or in the conceptual stage. We've been through the lead ship pain on the VIRGINIA Class and are applying the lessons learned to other ship classes. While the current VIRGINIA success isn't in the limelight right now, the submarine community must continue to press for the 2 for 4 in 12 goals or we may be in the limelight again.

The Navy needs at least 313 ships in 2020 to meet our warfighting needs. New technology should be developed to address warfighting gaps and not be developed for technology sake. Our job is to help procure and deliver these ships in the most cost effective manner. If there are good ideas that you haven't heard discussed,

I'd love to hear from you. Thank you for commitment and support for all our shipbuilding programs, especially the submarine portfolio.

Again, thank you for inviting me to speak to you today and I welcome your comments and questions.■

ETERNAL PATROL

CAPT Joseph J. Beard, USN (Ret)

CAPT Taylor Kent DeMun, USN (Ret)

CDR Joseph L. McGrievy, USN (Ret)

LT M. Keith Milne, USN (Ret)

CAPT John R. Patten, USN (Ret)

CAPT Hugh J. Rosania, USN (Ret)

CAPT Robert W. Ruple, II, USN (Ret)

Mr. Arthur Walton

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The background image shows a large submarine, likely a ballistic missile submarine, on the surface of the water. The submarine's conning tower and various masts are visible against a hazy sky. The ITT logo, consisting of a stylized diamond shape made of four smaller diamonds, is positioned to the left of the large 'ITT' text. Below the 'ITT' text is the tagline 'Engineered for life' in a script font. At the bottom left of the image, there is small text: 'ITT, the Engineered World logo and EDO are trademarks of ITT Corporation. ITT is a registered trademark of ITT Corporation. All other trademarks are the property of their respective owners. © 2005 ITT Corporation.'

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**LUNCHEON SPEECH AT JHU/APL
SUBMARINE SYMPOSIUM
REMARKS BY
RONALD O'ROURKE
MAY 13, 2008**

Thank you for the introduction. It's great to see you all again, and to have a chance to again share my thoughts with you at this symposium. I very much appreciate your continued willingness to hear from me, and I always try to repay that willingness with straightforward and, I hope, valuable remarks about where submarines stand in the larger public policy debate.

There are a lot of things I could speak to you about this year, but as you'll see in a few minutes, rather than trying to cover the waterfront, I've chosen this year to focus my remarks toward one culminating issue that I believe to be of increasing urgency for the submarine community and the Navy as a whole.

Foreshadowing: It's a cheap trick, but it works.

As always, I should note at the start that these remarks are my own and do not necessarily reflect the views of my employer.

Submarine Community Accomplishments

I want to begin by noting that, in terms of program management and execution, submarines are increasingly recognized as a bright spot within the overall situation of Navy shipbuilding:

- Navy shipbuilding has come under considerable criticism of late, but that criticism has focused on surface ship programs. Submarine construction, in contrast, has received more favorable reviews.
- The Virginia-class cost-reduction effort, which was fairly ambitious-sounding to others when it was first announced, now appears within reach of achieving its goal.



- The effort to evolve the Virginia-class design—which is part of the cost-reduction effort but is valuable in other regards as well—is achieving impressive results, such as the redesign of the bow section
- And the community appears to have identified a strategy for resolving the problem of preserving the submarine design and engineering base, which was a concern that I mentioned in my past talks here.

To varying degrees, observers outside the submarine community have noticed some or all of these things, which has helped to strengthen the community's reputation within Navy shipbuilding and defense acquisition in general.

Adding Boats to the Shipbuilding Plan

But when it comes to how well these accomplishments translate into administration enthusiasm for adding submarines to the shipbuilding plan, well, as my father used to say, that and two bits will get you a cup of coffee.

This is my 14th year of testifying, reporting, and speaking on the projected attack submarine shortfall, and in terms of addressing that shortfall through the addition of submarines to the shipbuilding plan, the end game is now within view. Since procuring three attack submarines per year is viewed as unlikely from a financial point of view, the primary window of opportunity for adding submarines to the shipbuilding plan was the period when the budgeted rate was one ship per year, and that period will come to a close in another year or two.

The projected size of the attack submarine shortfall has changed somewhat over time, due to changes in the force-level goal and the submarine procurement profile. In recent years, it has been eight boats, or 1/6th of the force-level goal. And against that shortfall, it now appears that the end result, after at least 14 years of warning time, will be the addition of one— or perhaps two—boats back to the shipbuilding plan.

I say perhaps two boats, because the Seapower and Expeditionary Force subcommittee of the House Armed Services Committee, in its markup of the FY09 authorization bill last week, recom-

mended adding \$300 million in advance procurement funding to support the acceleration of the second FY11 boat to FY10, which would make a space in the FY11 column for the addition of another boat, should policymakers support that option and the funding becomes available.

In terms of mitigating a shortfall in a force of 40-something boats, each additional submarine has significant value. But even if a second additional boat is funded, most of the projected shortfall will come to pass, and the submarine community will need to implement its plan for mitigating the shortfall through other measures.

Many years ago, I was invited to speak at a breakfast or lunch meeting of the Navy's submarine admirals, who had come together for one of their periodic meetings in Washington. I can't remember the year exactly, but it was long enough ago that Admiral Giambastiani, for example, had not yet transitioned to the joint arena. At that meeting, the topic of increasing the planned submarine procurement rate came up, and I said that, based on historical patterns, it was unlikely that Congress could single-handedly turn a 1-per-year submarine procurement profile into a sustained 2-per-year profile, because of practical limits to Congress' ability to add funds to the defense budget, and the many competing demands for such additional funds.

Based on historical patterns, I said, Congress on its own might be able to add a boat every once in a while, but the result over time might be to turn an administration-planned rate of 1 boat per year into something like 1.1 boats per year, meaning an average of one Congressionally added boat each decade or so. My point at the time was that most of the solution of adding submarines to the shipbuilding plan would have to come from the Executive Branch, because of the limits to what Congress could do on its own.

Many years later, events have unfolded roughly in line with what I said at the meeting, because the roughly 15-year period that began with my first testimony on the projected shortfall in 1995 will see one or two boats being added to the shipbuilding plan as a result of Congressional initiative. The Executive Branch helped with the first of those two boats by putting it into the shipbuilding plan after Congress last year provided advanced procurement funding for it. But in terms of adding submarines to the shipbuild-

ing plan, that's pretty much all that the Executive Branch has done in recent years, and you get the sense that the Executive Branch had to be dragged kicking and screaming into doing it.

As for accelerating the second FY11 boat to FY10, the administration this year has repeated the argument it made last year about the supposed disadvantages for the industrial base of the resulting 2-1-2 profile for FY10, 11, and 12, should a second additional submarine not be added in FY11. This has required me to repeat, in my testimony this year, the rejoinder to that argument that I had made last year.

Affordability of 30-Year Shipbuilding Plan

I want to turn now to the issue of submarine procurement in the years ahead, when two boats per year are planned. The question is whether that rate will be achieved. My sense is that if the Navy stays on its current path, it's very possible that the rate will turn out to be 1½ boats per year, or perhaps something less than that.

I believe this for two reasons. The first concerns the prospective affordability and executability of the Navy's 30-year shipbuilding plan, which includes that 2-per-year rate for attack submarines. In its report this year on the 30-year plan, the Navy acknowledged that its new estimate of the average annual cost to implement all 30 years of the plan is substantially higher than its previous estimates. The Navy's new estimated cost is now a lot closer to CBO's estimated cost, which the Navy last year had downplayed as *worst-case analysis* or as an *extremely conservative* estimate.

Last year, and the year before that, the Navy's strategy for executing the shipbuilding plan depended on a series of five assumptions concerning the future size and composition of the Navy's budget and the costs of future Navy ships. All five of these assumptions could be viewed as risk items, because there were grounds for questioning whether each of them would be borne out.

But although the Navy's strategy depended on these assumptions, the Navy was able to say that it had a strategy for generating the shipbuilding funds needed to implement the plan. The Navy's new estimated cost for the 30-year plan, however, is so much higher than the Navy's estimate last year that the Navy no longer appears to have a clearly identifiable announced strategy for raising the shipbuilding funds needed to execute the 30-year plan.

This situation is compounded by the disquieting fact that the Navy's new estimated cost for the plan, as high as it is, does not include the procurement cost of the 12 replacement SSBNs that are in the plan. The cost of these 12 ships was simply excluded from the Navy's calculation, with no explanation provided in the report. The Navy later testified that the cost of these 12 boats was excluded because their design has not yet been determined, making their cost too difficult to estimate with any reliability. But that explanation doesn't hold much water, because the 30-year plan includes other ships in the same time period whose designs also have not yet been determined, such as the replacement for the Aegis destroyers, and the Navy included estimates for the cost of those ships in its calculation.

In trying to explain why the cost of these 12 ships was simply excluded from the overall cost estimate, I surmised in my own testimony this year that the Navy might have been signaling to others that it was reopening, or reserving the right to reopen, the debate about whether a service should be asked to pay, out of its own budget, for the cost of building and operating platforms that perform a national mission rather than a mission more closely related to the service's own core missions. That's a rather nice theory, but I wonder whether I was being too clever by half—whether the real explanation is that the Navy simply didn't want to make the cost of the 30-year plan seem even more daunting than it appears by adding in the cost of these 12 ships.

Either way, outside the Navy, there's strong doubt about the Navy's prospective ability to implement the plan—and that's probably putting it mildly. Much of this skepticism is rooted in the recent cost growth that has been experienced in shipbuilding, which has caused the Navy's credibility in estimating shipbuilding costs to sink to a new low. I used to think that the Navy's credibility on this measure had hit bottom, but the Navy has continued to find new ways to make it go lower, so now I'm careful to avoid that formulation.

At a hearing earlier this year on Navy shipbuilding programs, Representative Taylor, the chairman of the Seapower and Expeditionary Forces subcommittee, characterized the 30-year plan as "pure fantasy," and said it was "totally unaffordable with the resources the Department of Defense allocates to the Navy for ship

construction.” And that’s from one of the strongest supporters of shipbuilding in Congress.

Navy Position In Allocation of Resources

Although the Navy, industry, and Congress can take various steps to minimize shipbuilding costs, the magnitude of the Navy’s apparent ship recapitalization financing challenge suggests that implementing the 30-year plan without reducing resources for other Navy priorities would likely require adding billions of dollars per year to the Navy’s budget in coming years.

And that gets me to the second reason I believe the planned 2-per-year rate for attack submarine procurement is at risk, which relates to the Navy’s current position in the process for allocating defense resources. In coming years, we may be heading, for a variety of reasons, to a less open-ended defense budget environment than we’ve had for the last several years. Defense resources relative to various funding needs might become relatively scarcer, and the competition for marginal defense dollars will become more difficult.

Right now, I don’t believe the Navy is well positioned to compete for those marginal dollars, for at least four reasons. The first is the sense among many observers that, in light of the burden they’ve carried in Iraq and Afghanistan, the needs of the ground forces will come first.

The second, which I alluded to half-jokingly in my presentation here last year, but which has since become less funny, is that while the Air Force has been publicly asking for more funding, the Navy hasn’t. Air Force officials in public statements have not been reticent about raising the issue of needing more money to fulfill their plans, and until very recently at least, have used a number of public opportunities to stress their service’s need for an additional \$20 billion per year for five years.

The Navy, in contrast, has spent much of the past eight years generally refraining from publicly asking for more money and emphasizing instead how new business-efficiency measures and other cost-saving actions will permit the Navy to implement its program without an increase in its planned budget top line. The Navy has sometimes acknowledged that the executability of its

shipbuilding program is *at risk*, but has not followed such acknowledgments with any requests for additional funding.

The Navy's approach of not asking for additional funding over the past several years may have been music to the ears of OSD officials who regularly receive pleas for more funding, but it has not created much of a foundation for the Navy to start laying claim to additional resources that might be needed to implement its shipbuilding plan.

The third reason that the Navy is not well positioned to compete for marginal DOD resources is that the Navy's recent emphasis on international maritime cooperation in security issues (previously referred to as the 1,000-ship Navy concept) can encourage others to believe (or can be used by others as an excuse to argue) that shortfalls in Navy capacities for performing certain missions can be mitigated, at least in part, by relying more heavily on other navies to perform these missions.

And the fourth reason I believe the Navy is not well positioned to compete for marginal DOD resources is that Administration descriptions of U.S. security challenges are dominated by references to the war on terrorism, while references to China as a potential security challenge are comparatively rare. In recent months, some Administration officials have begun to speak about China's military modernization a little more frequently and directly, but the topic remains very much a secondary one in discussions of the future security environment, compared to topics such as terrorism.

This way of describing the international security environment has prepared observers well for understanding arguments for additional spending related to counter-terrorism operations, but it has not prepared them as well for understanding arguments for additional spending prompted by Chinese military modernization. And that poses a particular challenge for the Navy, because a lot of the Navy's most expensive planned investments are for capabilities that would be useful or critical in countering improved Chinese maritime military forces in coming years. Of all the services, the Navy might have the most at stake in this issue.

Prospects, Given the Current Path

When you combine the prospective affordability of the Navy's shipbuilding plan with the Navy's current position in the resource-allocation process, the path that emerges is one that may require reductions in the outyears of the shipbuilding plan. Indeed, we've already begun to see such reductions. The plan for procuring 2 attack submarines per year is not the only candidate for further such reductions, but it's certainly one of them.

In light of this situation, I would not be surprised if the 2-per-year rate for attack submarines is eventually reduced to 1½ per year. Policymakers might find it easy to rationalize the reduction on the grounds that, with a 33-year service life, a rate of 1½ boats per year is consistent maintaining a 48-boat force over the long run. The fact that it's not consistent with maintaining a 48-boat force over the medium run might be acknowledged, but I wouldn't place money on that acknowledgement being enough to prompt a shift in the rate back up to 2 per year, particularly now that the executive branch has a proven record of acknowledging a projected attack submarine shortfall but not doing too much about it in terms of procurement.

A key dynamic underlying all this, it seems to me, is the fact that while maintaining the Navy is a long-term proposition, there are very few public officials with executive authority who themselves remain in office for an extended period of time.

Ships take years to build, and remain in service for decades. So it takes a long time to build up a Navy, and a long time for the force-structure consequences of underinvestment in recapitalization to become undeniably manifest. But there are very few executive officials who remain in office long enough to confront the longer-term consequences of their decisions. This situation makes it tempting to defer the costs of addressing difficult problems into the future and thereby shift them onto someone else's watch. It's happening now at the federal, state, and local level in a number of areas, such as retirement costs, health-care costs, and investment in public infrastructure.

And more and more, it seems to me, this is what is happening with Navy shipbuilding. When you add up the total number of battle force ships (meaning ships that count toward the total size of the Navy) that have been procured since FY93, which was the first

budget enacted following the disintegration of the Soviet Union, the figure is 85. That's an average rate of 5.3 ships per year, for 16 years. That rate, if sustained over the long run, could eventually result in a fleet of less than 200 ships.

It's OK, of course, to fall short of a steady-state replacement rate for a few years, as long as you make it up in other years. But Navy shipbuilding has now been below the steady-state rate for so long that the mathematics of the situation are becoming fairly daunting. Procuring a total of 313 ships over a 35-year replacement period starting in FY93 will now require an average of 12 ships per year for the next 19 years. And about three-quarters of those 12 ships per year, on average, would need to be larger ships, as opposed to LCSs.

At last week's meeting to mark up his subcommittee's portion of the FY09 defense authorization bill, Representative Taylor said that DOD, "continues to submit budget requests which reduce, not grow, the size of the fleet. The solution offered, every year, is that the solution will be delayed to future years." It's the frustration with this perceived situation of deferring difficult problems to the future, combined with the Navy's low credibility on ship cost estimating, that has encouraged Members on the House side this year to, in effect, take matters into their own hands by recommending significant changes to the Navy's proposed FY09 shipbuilding budget.

A Potential Different Path

So what does all this mean for the submarine community? To me, it suggests first, that, if the current path is not changed, the submarine community would be wise to begin exploring strategies for meeting requirements with a build rate of 1½ submarines per year, rather than two per year. Whether that would involve exploring the potential for SLEPing and refueling 688s, or building new SSNs with 40- or 45-year lives, or forward-homeporting additional boats, or changing crewing and deployment approaches, I don't know, but it might include one or more of those things.

Second, this situation suggests to me that a solid rate of 2 per year is not something that can be achieved simply by arguing the virtues of submarines and executing submarine acquisition programs efficiently. Doing those things can help, of course, but it

seems to me that the challenge facing the submarine community is no longer simply one of improving the community's position in the Navy's resource-allocation process. The primary challenge, it now appears, concerns future of the Navy as a whole, and that's not a challenge that the submarine community can solve by itself.

Meeting that challenge, it seems to me, will require strong and sustained Navy leadership regarding requirements and funding levels. I've been around long enough to know what that looks like.

The Navy should continue to do all it can to operate more efficiently and save money where it can, including in shipbuilding. But beyond that, Navy leaders need to be direct and forthright about developments in China or elsewhere that are driving mission demands, and they need to be honest—first with themselves, and then with others—about the capabilities it would take to meet those mission demands, about what those capabilities will realistically cost, about resulting funding requirements, and about the potential consequences of capability shortfalls, even if all these things are inconvenient for others in the Executive Branch to hear. Observers outside the Navy, I believe, would question the Navy's current level of effort on each part of that sequence.

My position gives me an opportunity to stand back every once in a while and assess broader trends, and while I don't want to be melodramatic, the more I examine this situation, the more I think we're heading—slowly, perhaps, but steadily—toward some kind of moment of truth concerning the future of the Navy. We like to think of ourselves as a superpower, and being a superpower means a lot more than simply having a powerful military. But having a powerful military is part of it, and having a Navy of a certain size and capability is a part of that.

We can put the issue off, and put it off some more, but at some point, we're going to have to decide as a nation whether we're going to have a Navy of a certain size and capability, or not. The strength of Navy leadership in coming years on this issue will influence the outcome of that question, and that dynamic, perhaps more than anything else, will determine what will happen with submarine procurement in the years ahead.

Thank you.

FEATURES

**USS SCORPION 40TH ANNIVERSARY
VICE ADMIRAL JOHN J. DONNELLY, U.S. NAVY
COMMANDER, SUBMARINE FORCES
24 MAY 2008**

Admiral Fountain, Mr. Hamilton, distinguished guests, ladies and gentlemen and members of the Submarine Force family, it is truly an honor to be with you today as we commemorate this tragic event in the lives of the submarine family.

And yet our reason for being here today is more than that. We are gathered here to remember, to console and to pray. To remember shipmates, friends and family members—those lost to us onboard SCORPION 40 years ago.

This memorial stands to honor the sacrifices of those gallant Sailors in their service to our country. And today's ceremony reminds us that the wonderful reunions that come at the end of long deployments can never be taken for granted.

Never be taken for granted because Submarine Sailors face the dangers of life at sea daily, and willingly, for they recognize that there is no higher calling than that of service to the nation they call home.

As we recall that time in American history, SCORPION was a member of the Skipjack class, considered the best submarines at sea in their day. And the Sailors who sailed in them were recognized as the elite of the Force.

With an elegant teardrop shaped hull, these ships prowled the oceans of the world bringing a speed and maneuverability not seen before. This new capability, manned with the brave men who went to sea, was necessary to meet the growing threat of the Soviet Union.

It's important to recall the Cold War mission of these submarines, as they gathered intelligence and shadowed their Soviet counterparts in often perilously close proximity.

As the last letters home from Petty Officer Violetti and Chief Weinbeck can attest, the SCORPION crew was intimately familiar with these missions.

So this morning, we gather together and pause, both as a Navy, and as a submarine family, to remember and honor our shipmates lost onboard SCORPION. We remember and honor their courage, and we remember and honor their service. But most of all, we remember and honor their answering of that highest call.

We remember Commander Slattery, COB Bishop, Doc Saville, Petty Officer Cross and all their shipmates. We remember them as heroes. And we are right to do so. They died, then, because of how they choose to live—in the life of service, proud of their freedom, proud of their country and proud of their country's cause—the cause of liberty.

In the last century, submarines existed to oppose the totalitarian regimes of Germany, Japan and the Soviet Union. Regimes that sought to oppress and rule other nations. And I would argue that it is no exaggeration of historical judgment to say that without these ships and their heroic crews, those regimes would not have been stopped in their oppression of countless millions. The crew of SCORPION will always remain part of that legacy.

The submarine profession is a demanding one. Some days, it can be quite exciting. It is certainly satisfying and rewarding. But it can also be a dangerous profession with most missions being completed beyond the public eye. While there have been hundreds of thousands of Sailors who have served onboard submarines in our 108-year history, the Sailors that we remember today made the ultimate sacrifice for their service to the country. And they remind us all what it means to go in harm's way.

We hone our skills in seas that can be calm and peaceful, but those seas can turn in a moment..... and the sea knows neither pity nor remorse. We serve our nation under those seas. We live with that risk—every day, on every mission, to serve our nation.

Forty years ago we lost 99 extraordinary men at sea. Sometimes we forget the courage it took for the crew of SCORPION to take to sea. But they were aware of the danger, and they overcame it.... to serve their country by taking on their final mission. And while we may never fully know the circumstances surrounding the loss of SCORPION, we mourn these 99 heroes. We mourn their loss together as a submarine family.

In our Navy, the common bond of service to country binds us closely as shipmates and a Navy family. For the families of the

SCORPION crew, we cannot truly comprehend, as you do, the full impact of this sacrifice. But we feel the loss, and we're thinking about you. Your loved ones were daring and brave, and they had that special spirit that said, "Give me a challenge, and I'll meet it." They had a hunger to serve their country, and they did so with honor. They served all of us.

These lives were cut tragically short. Some, like Petty Officer Donald Powell, were in their early 20s. But our responsibility is to remember the fallen as they were—as they would have wanted to be remembered—living in freedom, blessed by it, proud of it and willing—like so many others before them, and like many today, to die for it. And to remember them as believers in the heroic ideal for which this nation stands—the ideal of service to country and to others.

And so your Sailors are with us again today. And my words cannot match the power of the sacrifices made by those we honor this morning.

I am certain that we never truly lose the people we love, even in death.

Through the years, the legacy of this courageous crew has continued to shape our Submarine Force, by remaining in our thoughts and helping direct the decisions we make. Their service and sacrifice leaves an imprint on our lives. I hope you have found some comfort over the years knowing that your lives have been enriched by that legacy.

We pray that God will give some share of the peace that now belongs to those we lost, especially to those who knew and loved them in this life.

But as we remember together we are also thankful—thankful for their lives and their service. And proud too—as proud as they were—that they lived their lives as Americans.

Today's young Americans, young Sailors, young Marines—along with their brothers and sisters in the Army, and Air Force and Coast Guard—are as dedicated, as brave, and as determined as their predecessors. They are as equipped, with the example of fortitude and determination that grew from the sacrifices of those who came before them. They are motivated by those examples of service and heroism we honor today.

Many of them are out there today, afloat and ashore, taking the fight to the enemy. Many are on watch, undersea, in distant parts of the world. Others are getting ready to deploy, as their country has asked them to do. These young people, of whom I am so proud, are doing a magnificent job.

To the memory and legacy of those who made the ultimate sacrifice, to those resting with SCORPION in that hallowed place, we extend again the thanks of a grateful nation. We extend the promise that their sacrifice will always be honored. All of us who serve in the Submarine Force and wear the cloth of the nation today—we commit, we promise to do our duty so that America will remain the beacon of hope and the bastion of liberty. We make this promise in the memory of those who served and gave their lives as recognized by this ceremony.

While ultimately, the Sailors of SCORPION gave their lives for our country, let us also remember this: They also lived for our country. And they had been dedicating their lives every day..... by entering military service, through extensive training and preparation for this deployment, all the way up to that moment 40 years ago when they began their Eternal Patrol.

And their service gives special meaning and honor to their lives. The heroes of SCORPION achieved what they were reaching for. They made a difference—on their ship, with their shipmates, and in our Navy.

And forever in our history. May they rest in peace. ■



REMEMBERING PARCHE
SUBMARINE VETERANS MEMORIAL CEREMONY
REMARKS BY CAPTAIN BRUCE SMITH, USN (RET.)
RAMAGE HALL, NORFOLK, VIRGINIA
FRIDAY, 23 MAY 2008

Thanks, Tim. Ladies and gentlemen, distinguished guests, shipmates, it's an honor and a pleasure to be with you today to observe Memorial Day here in Norfolk. Being pretty much a Pacific Fleet sailor, I never shipped out of Norfolk, but I'm most appreciative of the unmatched contributions this port and this community have made to our Nation's defense, since our very inception.

I'm always moved by our solemn ceremony of tolling the boats. It reminds us of the *legends* who forged our Submarine Force's legacy—who led the way and who gave much—many who gave all. In particular, we remember those 52 boats still on patrol from WWII—plus THRESHER, still on patrol these 45 years—and of course, SCORPION, whose loss will be commemorated tomorrow at the very piers here in Norfolk where *her* families waited 40 years ago for *their* boat ... still on patrol.

As we begin this Memorial Day weekend, let us be mindful of that legacy—and of its cost. We do know that "Freedom isn't Free". Our Armed Forces' men and women have paid the price of our freedom for over two and a quarter centuries now, and some are sacrificing today while we gather here, they continue to preserve *our* precious freedom.

I'm honored to represent the crews of USS PARCHE, the boat I was privileged to command. I've been asked to talk about the boat today as she's inducted into this Submarine Hall of Fame. That could be a little tough to do. She was a truly unique boat, a *magic* boat—literally in a class by herself, one of a kind. So much to cover, so much could be said... but very little of which I'm at liberty to recite in public.

So what I'll try to do is

- *First*, establish a context by recounting our Submarine Force's remarkable ascendancy to take our place as a unique and critical element of our Navy.

- *Then* with that historical backdrop, zoom in on PARCHE and her crews. Both PARCHes, in fact—SS-384, CDR “Red” Ramage’s legendary WWII Fleet boat that showed us the way and SSN-683, our own nuclear powered Attack and Special Missions submarine that established an unparalleled record of success during her operational service from 1974 through 2004.

First, the context—the evolution of our Submarine Force as a crucial element of the Nation’s seapower and security:

Our Navy’s origins coincide with our Nation’s origins. Our Founding Fathers, in their wisdom, included in the Constitution the words, “Congress shall maintain a Navy.” *Maintaining* a Navy is vital to the United States. It was vital in 1789, and it’s just as vital today, for two fundamental and timeless reasons:

- Number one: ships take a long time to build—a navy is a large capital investment. You can’t just build a navy when you realize you need one. It either exists, and is ready, or it’s too late. That’s true today, more than ever before, with the complexity and cost of modern warships. I think we’re all aware of significant concerns for our Nation’s ongoing shipbuilding prowess and capacity.
- Number two: America is a maritime nation. That hasn’t changed. Geography is a simple fact—the rest of the world is literally oceans away. Our economic livelihood and our security rely on our Navy maintaining our sovereignty in those oceans, and on law abiding ships of all nations being able to move freely along the ocean highways. Always has, always will.

Our fledgling nation *did* build a capable Navy to secure our interests in the world and since the mid-1800’s, we’ve *maintained* deployed warships in all parts of the world. The world continues to change—but our need for forward presence persists. It’s kept us

strong and it's been there when we've needed it, time and time again.

In just a little more than a century since our inception, the **Submarine Force** has emerged as a crucial and irreplaceable element of that capable Navy. Ours is a legacy of adaptation through technological, strategic and tactical innovation.

- We came into being in 1900 with the delivery of USS HOLLAND by her inventor, John Holland. Beginning with a limited submarine and a limited vision of short-range submarines, principally assigned *harbor and coastal protection* duties we evolved substantially in the first 30 or 40 years of our existence, developing our submarines and our submariners.
- Some recognized the tremendous potential of these new platforms and we improved them to become longer range, offensively oriented.
- We gave them new, more reliable diesel engines, better batteries, more fuel, and more payload volume, improvements that would ultimately enable us to capitalize on their inherent stealth to go where our other forces couldn't go ... and to take the fight to the enemy.

Long-range *Fleet boats* began appearing in the late 1930s.

- In the nick of time to step up to a WWII mission that surpassed anything anyone expected—when our heroic submariners held the line in the Pacific.
- Now, this WWII part of our legacy is particularly important to us: it was then that we learned our trade & developed many of the strategies and tactics still in use today.
- For sure, it was the crucible that forged our character because it was then that our submariners were presented, virtually overnight, with a *new mission* and said simply, "We can do that." They *had* to ... there was no one else.

The war in the Pacific began with the crushing surprise attack by the Japanese on Pearl Harbor—a devastating blow. Following this surprise attack and for many months afterwards, I think many today may fail to fully appreciate—the Japanese were *winning*.

Our Submarine Force survived the blow and immediately took the fight to the enemy. Then and there was born the principle that, to a submariner and his boat, there is no such thing as *enemy-controlled waters*. Our submarines hounded the Japanese Empire, holding their forces in check until our Nation could recover and mount the effort that turned the tide and won the War in the Pacific.

Admiral Chester Nimitz later said,

When I assumed command of the Pacific Fleet on 31 December 1941, our submarines were already operating against the enemy, the only units of the Fleet that could come to grips with the Japanese for months to come. It was to the Submarine Force that I looked to carry the load. . . . It is to the everlasting honor and glory of our submarine personnel that they never failed us in our days of great peril.

Submariners represented less than 2 percent of Navy personnel during World War II, but accounted for more than 55 percent of our enemies' maritime losses.

That war produced legendary heroes. Submariners—that small 2 percent—were awarded seven Medals of Honor, and scores of Navy Crosses and Silver Stars. Our submariners today still recite their names and their exploits.

Names like Dealey, Morton, Street, O'Kane, Fluckey (Admiral Fluckey was our last surviving Medal of Honor winner, whom we lost last year) ... and Ramage, our WWII Parche skipper, for whom Ramage Hall here is so appropriately named. Our WW II Submarine Force *did* "carry the load," as Admiral Nimitz said, and they gave us our great legacy to carry forward.

Our post-WW II *diesel and nuclear-powered submariners* carried our legacy forward, playing a singular role in the Cold War.

The Submarine Force's role in the Cold War has become known more and more to the public, including some aspects of the critical role PARCHE played.

Our attack submarines carried out hundreds of difficult, daring missions—providing our national leaders and military commanders solid, often sole-source information on the capabilities, intentions, and activities of the Soviet Union and her surrogates. True to a maxim stated centuries ago by the Chinese warrior and strategist, Sun Tzu: the U.S. *knew ourselves* and we *knew our enemy*.

- Our attack submarines held the Soviet Submarine Force—and her other very capable forces—at risk. Those guys—the Soviets—*knew* they could never quite count on being *alone*.
- Our ballistic missile submarines—the “41 for freedom” launched in great numbers in the 1960s, and the Tridents that replaced them—were the one truly survivable leg of our strategic triad of bombers, land-based missiles and the boomers—the deterrent for which the Soviets had no answer.
- With each of these Cold War missions our submariners simply stepped up and did it—just like in WWII. They *had to*...
- Submarine technical superiority was the muscle in that victory but our submariners’ *can-do* spirit was the heart, overwhelming the Soviets’ calculus of numerical superiority.

And post-Cold War:

- Our 14 Tridents patrol in their vital strategic deterrent role, even as we’ve reduced the numbers of ready bombers and the missiles in the silos. Tridents are carrying an even greater share of that load.
- 4 Tridents have been converted from ballistic missile shooters to multi-mission SSGNs. They’re deploying today with Special Forces, large volume Tomahawk cruise missile loadouts and tailored Command & Control modules configured to operate from agile, covert forward locations.

- Our attack submarines have launched hundreds of successful, precision Tomahawk missions as we've seen in recent years, and continue to be tasked with worldwide Intelligence/Surveillance/ Reconnaissance (ISR) missions that have more than *doubled* over the same two decades that saw our SSN numbers dwindle by almost *half* – from nearly 100 in 1989 to just over 50 today.
- They're doing a lot of their work directly under Strike Group and Joint Force commanders, providing remarkable *eyes and ears* through the instantaneous pipes of modern connectivity.

Once again, they're stepping up, tackling twice the mission tasking with half the boats, and doing it well. Because they *have* to... There aren't a lot of liberty days on today's deployments, folks.

And of course, our new VIRGINIA class submarines are setting new standards in all areas of performance. USS HAWAII just completed a South Atlantic deployment and is receiving *finishing touches* from Electric Boat before she transfers to Pearl Harbor next year. NORTH CAROLINA was commissioned earlier this month and arrived in Groton this week to begin operating.

I visited USS HAWAII in the dry dock in Groton yesterday and walked the boat with her skipper. What a boat and crew! These new boats are terrific; they're being built on time, effectively and more and more affordably. Our Chief of Naval Operations and our Congress are pressing to step up the build rate as soon as feasible. They *know* we need submarines in sufficient numbers to *maintain our Navy* into this 21st century—that charter from our Constitution I mentioned earlier.

Now back to the part where we *zoom in* on how the *old* and the *new* PARCHEs feature in that story of our Submarine Force.

- First, the WWII PARCHE—one of the long-range Fleet boat design. She was built at Portsmouth Navy Yard and commissioned in November 1943, two years into the raging war. She arrived in the Pacific and commenced the first of six remarkable war patrols in March 1944.

- During her second patrol, on the night of July 31, 1944, *PARCHE* single-handedly engaged a Japanese convoy on the surface at night. In a 46-minute melee of savage combat, she shot 19 torpedoes from her forward and after tubes, sending over 20,000 tons of enemy shipping to the bottom.
- CDR Lawson "Red" Ramage, the skipper, had sent below to comparative safety all personnel but himself (to direct the attack) and a lookout to assist him. Parche was awarded the Presidential Unit Citation and CDR Ramage the Medal of Honor for this action.
- Later questioned as to how he mustered the courage to do what he did, he stated simply, "I got mad."

I never had the privilege to meet Admiral Ramage, but I spoke with Captain George Street and had several interchanges with Admirals Dick O'Kane and Gene Fluckey—all Medal of Honor—awarded WWII skippers. Over the years, I've spoken with a lot of our WWII submariners who *came to grips* with the enemy, and I have to tell you that, to a man, these heroes maintain that they were just *ordinary men* who did what was required when they were called upon in *extraordinary times*.

Men who, like our young submariners today, didn't set out to be heroes. But not quite *ordinary men*, I'd say!

Their story is our story. We stand on the shoulders of these heroes, we can never lose sight of that fact—it's *our legacy*.

The exploits of the Submarine Force in World War II are legendary. Think a moment, though, what life was like for those submariners, like those in Ramage's crew.

- Loading out for war patrols, in lines on the piers in Pearl Harbor, or Midway, or maybe Fremantle, Australia
- Sweating in the hot sun, passing down the bags of flour and cans of food, the spare parts, loading aboard all the provisions that would be needed to sustain 80 men for up to 8 or 10 weeks

- Knowing full well that much of their time would be spent deep inside enemy-controlled waters, without contact or support from anyone but their shipmates.
- Writing what too often turned out to be last letters to loved ones, then getting underway, not really knowing when, or even if, they would return, anxious ... even scared, but ready.
- Moving around the boat among those provisions, stacked and stuffed into every space—but stuffed carefully, so as not to make noise at the wrong time, that could give away the boat to a deadly, listening enemy—and cost the loss of the ship
- Cramped spaces, 80 or so men in a living area the size of a small house, living on top of the very torpedoes that would pay back the enemy for what had been started at Pearl Harbor
- In a hot, foul, humid atmosphere that reeked of diesel fuel, day after day – working, drilling, sweating – precious little fresh water, not enough for showers or laundry
- surfacing when it was safe, under cover of darkness—gasping for fresh, cool air when the diesel engines finally started, circulating the life-sustaining atmosphere from the outside world
- And the raw, gut-wrenching savagery that permeated each engagement with the enemy

Yet those elite, submarine heroes stepped up amid these tensions, adapting to this mission—using good old American ingenuity to make it work.

- When facing a protected, numerically superior enemy, PARCHE charged right into the convoy's midst on the surface at night, gaining an edge by creating havoc, disruption and chaos—and torpedoed the ships the Japanese depended on for sustenance.
- When the enemy thought he was in a protected harbor, far into shallow waters, our WWII heroes boldly slipped in on the surface, past the heavy harbor defenses—and exploded the precious cargo within.

- When the enemy was anchored inside an uncharted harbor, our guys made their own charts—from an old geography book, on one occasion—then went in submerged, in broad daylight, and destroyed yet another vital concentration of enemy ships.

They used every available means to gain an advantage, to try to turn the tide against superior odds. They somehow always *found a way*, because they'd determined, "We can do this."

"Red" Ramage's PARCHE emerged from the war victorious—6 patrols, 5 battle stars and 2 PUCs to show for it. Decommissioned in March 1946, her sail now stands at the Submarine Memorial Park at Subase Pearl Harbor, ever a monument to that ship, those crews and that Submarine Force that *held the line*.

Now to the second PARCHE – SSN-683:

Our USS PARCHE was built in Pascagoula, Mississippi at the Ingalls Shipyard, commissioned in 1974 and operated out of Charleston for a couple of years until she was selected for a set of special mission taskings.

She transferred to the Pacific Fleet in 1976 and was specially configured, operating out of Mare Island Naval Shipyard for the next 11 years. During that period, she deployed nine times, conducting highly specialized, classified missions.

From 1987 to 1991, the boat was again reconfigured in a five-year conversion at Mare Island. The reactor was refueled and a 100-foot section was inserted into her hull forward of the sail, as Mare Island transformed PARCHE into its own class of boat—just over 401 feet long!

After nearly two years shaking down and learning to operate the new systems at sea, the boat deployed again in 1993, returning 4 months later with another complete success, accomplishing the missions she'd been configured for.

With the closure of Mare Island Shipyard slated in 1995, PARCHE changed homeport to Bangor, Washington, to have her special operations gear tended by the Puget Sound Naval Shipyard in nearby Bremerton.

Even the homeport change was a *special* event. Conventionally, submarines change homeport with a reasonable gap in their

deployment cycles, to include time to move families and support functions over several months of transition.

PARCHE departed on her 11th special projects mission from Mare Island in 1994, returning over 3 months later to her new homeport in Bangor and moving directly into an intensive drydocked repair period within 2 weeks of reaching port—beginning the familiar high paced cycle anew! The boat deployed 9 more times from Bangor, about annually, before her decommissioning in October 2004.

Without discussing the specifics of PARCHE's classified configurations or tasking, I'd like to talk a little about that operating tempo and, in turn, the type of crews, that characterized the boat.

PARCHE's crews were some of the most successful submarine-ers ever assembled. I don't mean to brag by saying this. To the contrary, I think, our crews were comprised of sailors who, as individuals, were – like our WWII forebears – quite ordinary. It was as a *team*, though, that these crews shone.

I think it was simply because *they* "had to". They consistently performed missions they alone could accomplish—over a 30-year lifetime that included 20 deployments. While we struggled as a Navy and a Submarine Force to limit our yearly operational at-sea days to approximately 50%, PARCHE routinely operated 200, 250 or more days, year in and year out – save that lengthy refueling period in the late 80s. When the boat *wasn't* at sea, it was usually in an intensive shipyard maintenance period. There wasn't time to afford a more balanced tempo, due to the critical and unique nature of the ship's taskings.

In many senses, I guess our crew's operating lifestyle resembled the WWII submariners I talked about earlier.

- When we deployed, we went out, did our 3-4 month missions and returned.
- We were under *radio silence* for most of the deployment, receiving messages, but sending virtually none.
- We didn't visit liberty ports and we didn't replenish, except by covert rendezvous when mission success required a fix for some reason.

- We *did* deploy with food and supplies crammed into every space and when we left, there were cans of food stacked three deep on the deck outside my state-room—meaning it was like that everywhere!

And there *was* a degree of legitimate concern for safety, for being discovered, for a tell-tale dropped wrench or slammed hatch giving us away to the *bad guys*.

Frankly, we didn't know for sure what they'd do if they found us—even more so if they found we were PARCHE. And it wouldn't have been too hard to figure out who we were if we were somehow seen—those of you who have seen the boat know what I mean! Like no other!!

Our boat was uniquely configured, tough to operate (particularly at periscope depth), tougher and tougher to maintain (as the last of the 637-class, when parts and experienced maintainers became more scarce every year). And I know SSN means "*fast attack*", but I can't honestly say that to you people—I can settle for *attack* - PARCHE was a nuclear powered attack submarine—but we weren't very fast.

Our crews learned to operate our special systems and did it expertly. We couldn't tolerate less. At the same time, they maintained their proficiency as sonar operators, auxiliaries or similar submarine technicians – in *addition* to their "PARCHE quals". They just did more, because they *had* to.

This intensity brought our crews together quickly. Contrary to widely held belief, most of our crews were comprised of submarine sailors assigned like everyone else's. There was some screening, but more for security liabilities than any performance cut. So PARCHE's draft picks were pretty much the same as other boats got. The difference came about on board.

As each man reported to the boat he'd heard only vague rumors about—the boat's mystique building throughout her service years—he quickly ascertained where he was needed and fell into step. Each became more capable and more multi-tasked—because we *had* to. That's the mark of many successful businesses, blue chip sports franchises and other endeavors of excellence.

Consistent with the boat's motto, engraved on our seal (both PARCHEs' seals, in fact—SSN-683 drew our motto from our

predecessor), the crews—all the crews, down the years, lived up to the credo: *Par Excellence*. I don't know who chose it, but its simple elegance and charge to just *do it* and *do it well* made it fit just right for the two PARCHEs.

I don't know what else to say about it, but that these shipmates were the finest teams I've ever served with, before or since. Several years after I'd left the boat, while I was a Squadron Commander headquartered in San Diego, I embarked in PARCHE for a week and a half of training operations to share experience and special operating techniques with the incumbent skipper. The crew I'd commanded had since rotated off the ship—though a few had actually returned after an interim tour of duty elsewhere. I have to say that the crew I saw underway was every bit as good—in some areas, *better*, than those I served with first hand.

It's the legacy passed from our WWII predecessors and the tradition of unmitigated, unrelenting excellence, handed down crew member to crew member, that made the boat do so well for so long.

And I have to acknowledge Mare Island and Puget Sound Naval Shipyards here—the Special Projects organizations in those yards—when I talk about our teams.

Others that have to be included are the boat's *bosses* and their staffs—Submarine Development Group ONE and its later evolution, Submarine Development Squadron FIVE—and a number of planning, authorizing and coordinating organizations throughout the Navy's chain that kept the boat and the operating program focused, supported and on track.

I've steered clear of citing the boat's leadership, but with the benefit of comprehensive hindsight, I found myself in a forum with all 10 of PARCHE's Commanding Officers a couple of years ago, where we recounted a highly classified version of the ship's history. I was impressed, honored and humbled to be in that number—not because of a brash or swashbuckling atmosphere, or even an off-the-chart cerebral quality—though I'll tell you, some of them are among the sharpest I've ever met.

The main thing I noted, is that though we were different from one another in style and experience, each of us had a sure and well developed sense of operational priorities and decision-making processes. We faced unique challenges during each of our command tours and to a man, had devised unique—sort of extraordi-

nary, even unconventional—approaches to achieve success. We found a way ... we *had* to...And I'd probably follow any one of those guys, if he said "let's go". I'll say the same for most of the boat's Executive Officers and Chiefs of the Boat, down the years, as well. Two of the COBs are here with us – Dick Witte and Mike Kaufmann, the boat's 2nd and 3rd COBs. Thanks, shipmates. A truly phenomenal group.

Speaking as an outsider if I may for a moment—an admirer and supporter of USS PARCHE, I'll state that I think the record stands for itself. Over 30 years of sustained, superior service, the boat was awarded 9 Presidential Unit Citations and 10 Navy Unit Commendations—the most highly decorated warship in the history of the U.S. Navy ... period. It's with considerable personal humility—fired by an unavoidable pride in our *team*—that I'm honored to count myself among that number as a PARCHE sailor.

Similar to "Red" Ramage's sail, our PARCHE's sail now stands as a memorial, too—this one in the Puget Sound Maritime Memorial Museum park, situated adjacent to the ferry landing in Bremerton, not far from her final home port Shipyard. A commemorative room in the museum with a window that looks out on that proud sail provides the public an unclassified glimpse into the remarkable performance record of our boat.

One final observation. I would note that though USS PARCHE is the most highly decorated U.S. Navy warship, the boat isn't a *national celebrity*. If this sounds like my feelings are hurt, they're not ... it's perhaps most fitting that a flagship of the Silent Service, with a mission of stealth and classified secrecy, carry off that mission without undue fanfare or notoriety. So that's in a sense, sort of a final *mission accomplished*" and I thank many of you here for participating and keeping it that way!

Thank you for your attendance and attention. Thank you to the Submarine Learning Center and Submarine Veterans for hosting this event and honoring my shipmates and our boat in this fashion.

God bless our Nation, our Navy and God bless you all. Please bear in mind as we depart here today, what and whom we honor and remember—this and *each* Memorial Day. *Thank you.*■

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ARTICLES

**SCIENCE, TECHNOLOGY AND TACTICS
FOR THE FLEET
SUBMARINE DEVELOPMENT SQUADRON TWELVE
BY CAPTAIN KEN PERRY, USN
COMSUBDEVRON 12**

Next year DEVRON 12 begins its 60th year of delivering tactics for the Submarine Force. Aligned with the strategic concepts of Commander, Submarine Force and with the tactical priorities of submarine Type Commanders and operational commanders, DEVRON 12 today is delivering relevant and timely tactical doctrine for modern submarine missions.

For over one hundred years U.S. submariners have tackled tactical challenges, and today those challenges span the full spectrum of operations. Combatant Commanders demand submariners be experts at tracking quiet diesel and nuclear submarines in deep and shallow water, providing persistent covert reconnaissance, striking critical land targets with speed and surprise, and expertly handling their boats in regions of unforgiving contact density and constrained water. SSGNs are deployed now and project the power of large payloads, Special Forces, and robust communications to areas of national interest. And SSBNs continue to anchor the nation's defense with the world's most capable strategic deterrent.

From maritime interdiction to maritime security, from the Western Pacific to West Africa, from the Southern Command to the North Pole, today's submarines are engaged in diverse operations against dynamic threats in challenging areas around the world. To meet these challenges DEVRON 12 continues to build upon the foundation of science, technology, and analysis that has served the Submarine Force's Center of Excellence for tactical development since 1949.



Meeting the Challenge of new Technologies, Threats, and Missions: An Enduring Role

In the years following World War II, forward-looking Submarine Force leaders recognized that an accelerating wave of post-war technological development could fundamentally transform undersea warfare. Improvements in sensor and weapons technology foreshadowed the potential for a submarine vs. submarine ASW mission. New tactics were vital to harnessing this new technology and executing this new mission. To address this need, DEVGRU 2 was formed in 1949, followed in 1963 by the establishment of the Tactical Analysis Group and the concept of a submarine tactical development organization with the synergy of squadron command authority and tactical development responsibility.

Today, DEVRON 12 is a force leader in coordinating operational commands, acquisition sponsors, and system developers in prioritizing the tactical needs of the Submarine Force and delivering doctrine and system capabilities to meet those needs. In the past two years this vibrant partnership has supported the fleet with:

Innovative and relevant tactics: DEVRON delivered the Submarine Force's first modern Maritime Interdiction tactics for a priority warfighting scenario, overhauled the legacy Submarine Tracking Manual for modern ASW missions, modernized Tomahawk Strike guidance and produced a new library of employment manuals for advanced sonar and combat systems.

New, relevant capabilities: Working with the Submarine Force (SUBFOR), Space and Naval Warfare Systems Command (SPAWAR), and fleet commands, DEVRON spearheaded fleet deployment of a new two-way Communications-at-Speed-and-Depth system to exploit the nuclear submarine's inherent strengths of stealth and mobility. DEVRON partnered with industry partners to design, develop and introduce the first tactical display to fuse real-time sonar data with high-confidence target solutions for improved tactical awareness.

Real-world mission analysis: DEVRON analyzed over 75 real-world missions to advance SUBFOR and Navy understanding of potential adversaries; contribute to submarine mission safety and security; and provide actionable feedback for improved tactical performance on station.

Dialogue with the waterfront: DEVRON rejuvenated the periodic SUBFOR tactical newsletter. Six editions have been produced within the last two years.

Prioritized tactical requirements: As Chair of the Submarine Tactical Requirements Group, DEVRON 12 led prioritization of SUBFOR tactical requirements and engaged with fleet, Systems Commands (SYSCOMs), training commands, and industry partners to align tactical warfare system development and testing with fleet needs.

Effective exercises and analysis: Created the Submarine Tactical Objectives Road Map to prioritize tactical development, conducted over 24 Tactical Development exercises in key submarine mission areas and tactical security, and improved the rigor, timeliness, and relevance of analytical reports.

Ensuring Operational Safety and Security

U.S. submarines are deployed in every operational theater. The missions are challenging and diverse. All involve risk. To ensure the continued safety and security of operations, the Submarine Force continuously evaluates its mission requirements and the effectiveness of tactics, technology, and training. DEVRON is fully engaged with operational commanders and other key partners on the waterfront to ensure that the needs of the fleet remain the primary driver in developing new tactics and technology.

DEVRON analysts, with a healthy combination of operational and analytical experience, review every mission conducted by deployed submarines. Teams of professional analysts and current and former submariners review ship and sensor employment, tactical decision-making, system technical performance, and the tactical and natural environment to determine the key safety and security issues of the missions. This *deep dive* into the actual performance of real-world missions yields valuable insight into the effectiveness of existing tactics and technology. In past reviews, DEVRON has identified procedures and doctrine which required improvement to address new tactical challenges being faced by submarine crews. With the help of fleet operators and system developers throughout the Undersea Enterprise, DEVRON developed improved tactical doctrine and system employment guidance to address real-world fleet needs culminating in a

comprehensive revision to the manual for reconnaissance operations, new war fighting doctrine for a major combat scenario, and revised measures to improve the tactical security of attack submarine operations and strategic patrols.

Developing New Tactical Insights with Limited Resources

When the DEVRON tactical analysis concept began back in 1949 the drivers were operational challenges, new technologies, and evolving threats. These same forces shape the squadron's tactical development priorities today. As the scope of missions and global presence has grown, however, the number of submarines available to conduct exercises has decreased. A smaller force structure, continued high COCOM demand for deployed submarines, and a strong pull for submarine support of Carrier Strike Groups and other fleet certifications means there are fewer submarines available to participate in tactical development exercises. To continue the necessary work of tactical development, DEVRON 12 is working harder—and smarter—to develop and validate tactical doctrine with limited at-sea exercise opportunities. These efforts include:

Submarine Tactical Objectives Roadmap (STORM): Each year DEVRON 12 prioritizes Submarine Force tactical development objectives to address the critical issues revealed by real-world mission analysis, threat assessments, and exercise results. These priorities, coordinated throughout the Undersea Enterprise, provide the framework for the annual tactical exercise plan and allocation of high demand submarine assets and analysis resources.

Analysis Strategy: Delivering rigorous and relevant findings for modern missions requires modern analytical methods, balanced staffing, and fleet focus. The analysis process at DEVRON is viewed as a system where the team identifies operational challenges or technology innovations that have potential to affect current or future submarine operations (an input), and initiates a plan of action to develop new tactics that are properly examined and validated (the output). This *system* breaks down operational issues into questions that must be answered or hypotheses that must be tested so that a desired end state (a tactical objective) can be achieved.

Asking and Answering the Right Questions: Developing the right questions is essential to shaping the type of exercise we'll conduct at sea or the simulation we'll run ashore. The right questions leads to the right type of exercise or simulation. The right exercise yields the right data, and the right data yields answers that are analytically correct and tactically relevant. To meet the needs of a fast-paced submarine fleet, DEVRON must balance analytical rigor with timely results. To improve that balance DEVRON recently revised its analytical support services to align exercise planning and analysis with the priorities of modern submarine missions. The squadron is now performing a critical evaluation of its analysis process—SUBFOR's first Lean Six review--to identify where changes are warranted.

More Modeling and Simulation: Modeling and Simulation (M&S) capabilities have improved tremendously. Submarine Multi-Mission Team Trainers installed at submarine training centers offer tactical training with unprecedented realism. As M&S has matured, DEVRON has increased the use of M&S in the development and validation of tactical guidance. With M&S, analysts can use validated models of the environment, targets, and weapons to examine large numbers of trial engagements. The results can be used to determine a tactic's effectiveness with statistical confidence and at less cost and in shorter timeframes than actual in-water exercises. Additionally M&S results can focus the direction of future exercises and identify new leads for promising tactics. A recent success in this area is the examination of torpedo evasion tactics. Earlier this year, DEVRON ran over 50,000 simulated torpedo evasion scenarios within a two month timeframe and with a minimal investment of manpower. The resulting data provided new insights for torpedo evasion tactics. The speed of the trial, the statistical validity of the results, and the tactical relevance of the findings are promising signs of the power of M&S in tactical development.

Balance: Despite the advances in simulation technology, M&S techniques won't eliminate the need for at-sea exercises. The complexity of the ocean environment and submarine warfare demand that real at-sea performance be factored into critical tactical development. Rather than replacing at-sea testing, M&S will complement in-water exercises by providing insights that help

shape the construction and execution of at-sea exercises. This will generate more focused and more productive at-sea exercises, allowing DEVRON and key partners to conduct advanced tactical development with limited submarine resources. When one considers the cost-to-benefit ratio of incorporating M&S into the overall tactical development process, it is easy to understand why high-fidelity modeling will grow to be a major element in DEVRON's future contributions in addressing the tactical issues faced by the Submarine Force.

Improving Communication with the Fleet:

DEVRON's core strength has always been the synergy of squadron operations and tactical development. And the key to the synergy is having the pulse of the fleet. The Submarine Force has one set of core missions and uniform standards of excellence, but there are fleet differences in tactical priorities. The geo-strategic environment of the Pacific may drive a tactical focus on ASW, for example, while EUCOM may place a theater priority on maritime security and regional engagement. Similarly, the diverse *battlespaces* of the submarine Type Commanders and Task Force Commanders influence respective priorities for manning, training, and equipping the force and employing boats on deployment. In every case, it is important that DEVRON 12 stay in close communication with COMSUBFOR to understand the tactical doctrine needs of the force and develop relevant solutions.

To do this, DEVRON maintains a constant dialogue with the fleet on tactical issues. Frequent communications with TYCOM staffs, waterfront briefings, technical and tactical exchanges with key partners, urgent message changes to tactical guidance, collaboration on naval warfare publications, exercise summaries, and real world analysis reports are some examples of this essential communication. In recent years, we've also updated our classified website with "Ask the Expert" and "Ask the Librarian" forums that respond quickly to questions from submariners throughout the fleet, and re-introduced the Submarine Tactics Newsletter with topics of current tactical interest.

In addition to improving the mechanisms of communicating with the fleet, DEVRON is also working to improve the content and usability of tactical guidance and publications. Eighteen months

ago, on behalf of the Force Commander, DEVRON developed a new Force Doctrine Strategy for developing and issuing doctrine and combat systems employment guidelines. Underlying this strategy was DEVRON's principle that the real value of sonar and fire control is not how much capability we build into new systems, but how much capability the crew gets out of their systems. The doctrine strategy is aimed at ensuring that when new tactical systems are fielded on our submarines, the crews have the right employment guidance at the right time to get the full measure of capability out of their new systems.

Shaping Future Capabilities – Fleet Involvement Pays Off

Shaping future tactical capabilities is an important element of Squadron TWELVE's mission. As chair of the Submarine Tactical Requirements Group, DEVRON 12 is chartered by COMSUBFOR, COMSUBPAC, and Director, Submarine Warfare Division (CNO N87) to provide the singular fleet input for tactical modernization requirements. DEVRON leads the force effort to prioritize capabilities and provide the fleet input for modernization recommendations to COMSUBFOR and COMSUBPAC. Following endorsement by Submarine Force leadership, these recommendations are resourced by CNO N87 as part of the Advanced Processor Build (APB) process.

To help keep new systems aligned with fleet needs, DEVRON 12 stays *plugged in* to the development and testing process. DEVRON 12 leads the Tactical Control Support Group which serves as the fleet's voice for liaison and oversight of APB upgrade functionality, and provides guidance to the Concept of Operation Support Groups which define the Operator Machine Interfaces (displays, etc.) and the utility of algorithms. This participation provides a *customer* look on the real usability of the product and keeps the DEVRON staff "APB multi-lingual", able to assist the fleet in the nuances of system operation and optimization as questions arise.

A success story in-the-making for the fleet and the APB process is the Integrated Battlespace Awareness Layout, or I-BAL ("Eye-ball"). I-BAL is the direct result of a DEVRON 12 initiative to improve tactical awareness, decision-making, and risk management in a high contact density environment. I-BAL began in September

2006 with a DEVRON 12 concept for presenting the contact picture in a more intuitive, coherent, and actionable way. The design effort that followed included use of the Submarine Multi-Mission Team Trainers to conduct multiple Watch Section Task Analyses of DEVRON 12 led submarine command teams in high-contact density scenarios. The result—scheduled for at-sea testing this summer and fielding aboard submarines beginning in early 2009—is a radar-type PPI display that combines real-time sonar waterfall data with contact solutions similar to a maneuvering board. I-BAL has been field tested by shipdrivers in the Pacific and Atlantic and is a real success story of the productivity that results when the fleet and the development community work closely together.

Pressing Forward into the Future

The *Science, Technology, Tactics* in DEVRON's command logo have each changed tremendously in DEVRON's history, as have the missions of the force and the threats we face. The constant among the change is the essential synergy of waterfront operations and tactical development that is unique within the Navy, and which forms the core strength of the organization. As DEVRON enters its 60th year of support to the Submarine Force it does so with awareness of the value of science and technology in tactical development, but also with keen understanding that *the Fleet comes First* and even the most advanced science and technology exists only to deliver capability to the crew.■

UNMANNED UNDERSEA VEHICLES: AN ASYMMETRIC TOOL FOR SEA DENIAL

by LCDR Matthew R. Ritchey, USN

LCDR Ritchey is a Submarine Officer (Reserve Component), currently serving on an active duty fellowship with the CNO Strategic Studies Group (SSG) at the Naval War College in Newport, RI. He previously served on active duty at United States Fleet Forces Command (USFF, then CFFC) as the Submarine Special Projects Program Manager (N23), and Engineering Officer on USS MONTPELIER (SSN 765). LCDR Ritchey has served in reserve assignments with both the Naval War College and the U.S. Forces Korea support units. In his civilian career he works at Raytheon Integrated Defense Systems as the Program manager for the Virginia-Class Submarine Combat Control system.

Editor's Note: LCDR Ritchey was awarded the 2008 Naval Submarine League Naval War College Prize for the best essay on submarines and antisubmarine warfare for this article on UUV's.

I. Introduction- Asymmetric Undersea Warfare

For almost a century, undersea warfare has generated strategic and operational surprise for maritime planners. In World War I, the German decision to engage in unrestricted submarine warfare was a key factor behind the United States' decision to enter the war. In World War II, the German U-Boat campaign almost brought Britain to its knees, and disaster was averted only through the extraordinarily rapid fielding of new technologies and operational methods; while in the Pacific, the spectacular success of American submarine commanders in their *guerre de course* against Japanese merchant shipping eviscerated the Japanese wartime economy. During the Cold War, submarines evolved into a strategic deterrent role fueling a decades-long competition for dominance in the cold waters of the North Atlantic.

If there is one constant in undersea warfare, it is its unwelcome intrusion into the carefully constructed schemes of military planners. Undersea warfare is inherently maverick, unconventional, and disruptive. There is little reason to suspect that, as conflict becomes ever more asymmetric, undersea warfare will not again demonstrate the ability to disrupt operational planning. The continued rapid evolution of technology, combined with inherent complexity and difficulty in *dominating* the undersea environment, challenge confidence in any enduring claims of *undersea superiority*. Particularly threatening to such claims are the nascent capabilities of Unmanned Undersea Vehicles (UUVs).

One of the most salient military technology trends is the growing prominence of unmanned vehicles. The promising potential of unmanned technology has already reached fruition in the air domain, as witnessed in the recent wars in Afghanistan and Iraq. There is every indication that there could be similar impact in the undersea domain. This paper contends that Unmanned Undersea Vehicles (UUVs), currently most prominent as Intelligence, Surveillance and Reconnaissance (ISR) assets and as capability-augmentation to capital platforms, will come into their own as an independent combat capability, creating operational and strategic level effects and, through their inherent asymmetry, deliver powerful capability to lower-tier navies and even non-state actors. Without anticipatory planning, and perhaps even despite it, top-tier state actors such as the U.S. will find themselves challenged in their ability to counter the threat of *sea denial* posed by UUVs. UUVs could have a major effect on the operational level of war, by challenging many key assumptions around which campaign planners have based their planning.

2. UUV trends and development potential

UUVs are a rapidly expanding area of investment and research across the globe, both commercially and militarily. The high price of oil and seabed minerals is driving commercial investment in UUVs for oceanographic research. Militarily, there is significant investment from at least a half-dozen European navies, in addition to the United States, and there are probable covert programs in China, DPRK, and elsewhere. Illicit activity—especially drug-running—is yet another source of investment in low-end UUVs.

The primary role anticipated in today's military UUV development efforts is mine-hunting, for which purpose hundreds of UUVs have already been delivered to a wide array of international customers¹. A notable secondary mission driving UUV development is ISR, to include hydrography and mapping. These primarily defensive and supporting missions belie the potential for offensive employment of UUVs.

Because the primary overt investment in these programs comes from NATO countries, there is less interest in offensive employment of UUVs than might be the case for potential adversaries. The operational concepts favored by dominant western navies, which generally presuppose a superior force with the objective of sea control, have less need for autonomous offensive capability delivered from a UUV. U.S. and NATO operational ideas also are heavily dependent on robust C2 arrangements, and require considerable operational flexibility,² for which UUVs are generally less well suited than multi-mission manned submarines. Furthermore, legal considerations and the need to remain compliant with existing legal regimes significantly complicate development by first world navies. Finally, safety considerations, especially considerations associated with arming UUVs, present obstacles to the U.S. and its allied navies.³

The trajectory of current UUV efforts, however, should not limit consideration of how developments might be leveraged by non-Western powers. The experience of asymmetric warfare has repeatedly shown that challengers will willingly and eagerly co-opt western technical developments, and modify and adapt them to suit their own purposes. UUV technologies lend themselves especially well to this approach. The UUV market is already heavily internationalized, with relatively little control over technology transfer. Most UUV development is heavily COTS (Commercial, off-the-shelf) based,⁴ and UUV development tends to be modular, in order to accommodate payload interoperability, a design that facilitates adaptation for offensive purposes. Compared with many other systems, UUV design is relatively straightforward, with fewer interoperable systems and component parts, facilitating reverse-engineering of any components that might be restricted in the commercial marketplace. All of these factors increase the likeli-

hood that even a low tech adversary could build on western UUV R&D to field offensive, autonomous UUVs.

Three very achievable developments are especially foreboding for this future asymmetric threat. First is the arming of UUVs to create Unmanned Combat Undersea Vehicles (UCUVs). This is, in fact, already accomplished, in a sense. Torpedoes might be considered UUVs⁵—operating autonomously, in many cases, without real-time connectivity back to their launch platform. What distinguishes them from *UUVs*, in common parlance, is their limited duration and operational flexibility. However, these limitations are mostly CONOPS driven, as opposed to technically driven. A simple armed UUV might be constructed around a torpedo, with the simple addition of a propulsion booster module to add range and endurance, and a basic communications package.

A second potential technology development is radically extended operational ranges for these armed UUVs. Already, the U.S. and others have invested in programs to create long-range underwater *gliders* to conduct long-range Intelligence Preparation of the Operational Environment (IPOE) missions.⁶ While the technologies enabling the *glider* approach probably do not provide the flexibility and propulsion power to enable armed UUVs, such programs will significantly advance the state of UUV navigation and communications technologies. Leveraging these advancements, other nascent technologies—such as Air-independent-propulsion (AIP, e.g. Fuel Cell) propulsion or perhaps Aluminum/Vortex Combustors, could provide the propulsion power necessary to effectively deploy armed UUVs even well outside of the operating area limitations of conventionally powered submarines, indeed, even globally⁷. Divorced from the human sustainability considerations that limit manned submarines, there are few remaining constraints on the range of UUVs. Underwater navigation, when safety considerations are minimized, is remarkably easy (assuming accurate charts are available); and global communications are already a reality.

Finally, *autonomy* for these armed, long range UUVs will allow them the flexibility to conduct operations far away from the base of an adversary. Artificial intelligence (AI) based autonomous control systems are being developed at a frenetic pace, fueled principally by demand for improved UAVs. Such developments will directly

contribute to UUV autonomy, but in fact, are not actually necessary for the majority of *sea denial* missions envisioned for UCUVs. Even with current state of missile seeker technology, UCUVs would only need enough autonomy to navigate to a known area of operations for U.S. forces (a port, choke point, or coastal location) and launch, and the missile would do the rest. For more complex missions, weapons could be guided by an on-site observer, for instance on a trawler or even on foot ashore, in real-time or near-real-time.

In short, there are a remarkably small number of *hard* technology barriers standing in the way of the proliferation of long range, autonomous, armed and capable UUVs. There is little reason to think that this capability will be limited to high end, state actors.

3. The threat to U.S. Operations

Even the best current Operational Art practice leaves U.S. forces with significant vulnerabilities to the dramatic new capabilities that these UUVs will introduce. While armed UUVs will, no doubt, make significant contributions to sea control and sea supremacy, it is in their role as a centerpiece of a sea denial strategy that their impact will be most profound. To illustrate this, consider vulnerabilities of U.S. forces in three of the six *operational functions* around which operational planning is based. *Operational Sustainment (Logistics)* is especially vulnerable, as are *Operational Protection* and *Operational Maneuver*.

Operational Sustainment is a major concern due to the risk of attack on the massive seaborne logistics train associated with expeditionary operations. Such disparate missions as Peace Enforcement, Major Combat Operations, SSTR, etc. all have in common the need for heavy sealift. Sealift requires significant footprint at Seaports of Embarkation (SPOEs), a lengthy transit, often through choke-points, and finally, significant footprint at Seaports of Departure (SPODs). At each point, the often predictable sealift train is extremely vulnerable to UCUVs, which will be difficult to counter. In historical examples of submarine threat to sealift, convoying was an effective counter, but only because of the risk to the submarine of attack against escorted merchants. This risk is not shared by expendable UCUVs.

It is also important to note that long range UCUVs can threaten operational sustainment in ways that the submarine threat, especially in recent times, has not. While German U-Boats in WWII had the range to threaten maritime logistics even into U.S. territorial waters, in the subsequent half-century no adversary Submarine Force other than the Soviet Navy has had the capability to threaten U.S. operations on a global scale, and especially into U.S. home waters. Most of the conflicts of the past fifty years have been *regional*. In this context, a defensive Anti-Submarine Warfare (ASW) posture within the *theater of combat* has become familiar. However, planners have not had to anticipate a submarine threat in home waters, in transit in adjacent theaters, or within the protected confines of SPODs⁸ UCUVs break this paradigm, thereby complicating sustainment planning, indeed threatening the very concept of a *regional* war, perhaps giving *regional* actors a *global strike* capability.

Operational Protection and *Operational Maneuver* are also challenged by UCUVs. Just as UCUVs can threaten sealift assets, the UCUVs could be armed with weapons systems to either attack personnel (afloat, or ashore)⁹ or capital ships. Prominent commentator and analyst Robert Work of the Center for Strategic and Budgetary Assessments (CSBA) is one of the few strategists who has understood the potential of UUVs in this role. Work notes that "UUVs could determine which ships are coming out of port and move in to attack them."¹⁰ While the mechanism of this attack (cruise missile, torpedo, etc.) and the lethality of the payload (conventional explosive or mass-effect) is not unique to the UUV, the surreptitious method of delivery and vexing ability to defend against it makes a UCUV-based attack fundamentally unique at the operational level of war.

The net effect of the threat to these three operational functions can be summarized to conclude that UCUV employment is a form of *sea denial*. While UCUVs have a limited role to play in offensive operations, they can be highly effective in denying the use of the sea to a more powerful adversary. As such, they comprise a potentially powerful asymmetric tool that can *level the playing field* especially against an expeditionary adversary. The sea denial concept of a *fleet in being*—the threat posed by the mere presence of a capability—is especially pronounced for UCUVs, which could

be used very effectively as a first-strike capability due to their low operational profile.¹¹

Some might disagree with this assessment of vulnerability, and counter that the U.S. already takes undersea warfare seriously, as evidenced by our standing ASW capability and history of ASW excellence. This stands in marked contrast to past wars, in which lack of preparation created vulnerabilities to undersea threat. Some would argue that despite current challenges, our ASW capability still should be evaluated as *good*, by historical standards.

However, such an argument overlooks the fundamentally asymmetric nature of undersea warfare. History demonstrates that undersea warfare will adapt to attack the *seams* of an opponent's plans, whether they are strategic or operational vulnerabilities (e.g., unprotected merchants), technology gaps (e.g., acoustic vulnerabilities), or legal/ROE constraints (e.g., unrestricted submarine warfare). Current ASW practices, designed to counter manned submarines, are not sufficient to counter UUVs. Upon further examination, the ASW template breaks down completely as a method for addressing the UUV threat.

4.1. ASW- Founding assumptions and gaps against UUVs

ASW has never been an easy capability to master. However, today's U.S. Navy can claim a history of over fifty years of ASW excellence, through the exploitation of certain characteristics that make submarines vulnerable. The first of these comes in the ability to detect submarine communications. The most basic and useful information that might be gathered is location. Starting in World War II, High Frequency Direction Finding (HF/DF) was the first historical *breakthrough* in ASW. Submarines have reacted to DF by minimizing communications and employing technologies to mask the location of their communications. However, in many cases, vulnerabilities exist despite precautions. Even highly capable submarine forces are vulnerable to techniques exploiting patterns in the communications themselves or the progression of Areas of Uncertainty (AOU) over time. These vulnerabilities are an important element of today's U.S. ASW capability.

Another key element of submarine detection and tracking is acoustic sensing. First developed towards the end of World War I, sonar became the main enabler of ASW during World War II. In



response, submarine designers and operators took steps to reduce acoustic signature, both to active sonar, through the use of hull coatings, and to passive sonar, through the use of quieting techniques. Commanders learned to use the ocean environment to mask signature to both forms of sonar. Today's ASW practices remain heavily dependent on acoustic sensing. Submarine based ASW assets primarily use passive sensing, surface ASW platforms are more likely to use active sensing, and airborne ASW assets can effectively employ both. Additionally, fixed and deployable sensor arrays can be used to significant effect, but in a more limited number of scenarios.

Finally, a critical enabler of today's U.S. ASW capability is Indication and Warning (I&W). Through a wide variety of highly sensitive technologies, especially space-based SIGINT systems, U.S. ASW greatly benefits from the ability to focus ASW platforms on a manageable number of candidate submarines. Typically there is cueing that submarines have deployed from their piers, and additional intelligence information gives insight into the likely operating areas, duration of deployment, and mission of deploying submarines. While adversaries can employ countermeasures such as covering submarine piers and other OPSEC measures, the U.S. has nonetheless found effective ways to garner highly useful intelligence. This is due, in large part, to the generally manageable number of submarines employed worldwide; even the largest submarine forces do not have more than a few dozen operational submarines in their inventories. This enables rigorous hull accountability as a technique to both enhance alertment and prescribe technical parameters for acoustic search. The I&W capability of the U.S. is a *force multiplier* for ASW forces, and helps to enable ASW forces to overcome the challenges of submarine detection.

Across each of these critical enablers of ASW, however, UUVs will undermine the credibility of current ASW practices. It has already been demonstrated that quiet, modern diesel (SSK) and AIP (SSI) submarines are incredibly difficult to detect with either passive or active sonar,¹³ and their simple design and smaller size will make this even more true for UUVs. The dramatically reduced need for a large pressure hull for crew safety and operations, which in manned submarines is a major design constraint, will further reduce the complexity of the UUV and also allow it to operate at

depths prohibited to manned submarines, complicating both active and passive sonar detection.

Communications from UUVs will not be markedly easier than for manned submarines, and UUVs, like manned submarines, will be vulnerable in proportion to their communications. However, because these UUVs will be *single mission* units—unlike multi-mission manned submarines, there will be less need to communicate to coordinate operations. Also, as unmanned vehicles, there will be less need to communicate for safety-of-ship reasons or crew matters. Nonetheless, for effective use, some communications will be required, even in the most cavalier Command and Control (C2) arrangements. However, in many of the asymmetric missions in which UUVs might be employed, these communications might be masked in the *noise* of commercial communications, perhaps even through the use of commercial cell phone, widely available in the near littorals, or INMARSAT. While *detectable*, such a communication would be near impossible to discriminate, especially if there is little in the way of pre-alertment or an established operating pattern. For a high-end adversary employing UUVs, low-probability-of-intercept (LPI) SATCOM is just as feasible from a UUV as it is from a manned submarine.

Because of their small size and independence from crew concerns (manning, provisioning, etc.), there will be little need for UUVs to be deployed from conventional naval facilities. These UUVs could be deployed by either dropping them off the side of a commercial vessel¹⁴, or even by dropping them from a truck into the sea, directly from any coastal location. This flexibility in deployment, coupled with the lack of any need for deployment preparations (maintenance could be done well inland, away from prying eyes), will severely challenge I&W alertment of UUV deployment.

While it is difficult to predict the specific costs of future armed long-haul UUVs, it is likely that they will be significantly cheaper to build than manned submarines. Operating costs will also be lower, from both maintenance and manning/training perspective. Because of this, it is likely that navies or irregular forces employing UCUVs will have considerably more units in inventory than is the case with manned submarines. This large quantity alone, coupled

with the I&W challenges already mentioned, will critically challenge ASW practice.

4.2. Mine Warfare (MIW) paradigm challenges

Since ASW is, therefore, fundamentally unsuited to address the problem of UUVs, an alternate approach is needed. In examining the way UUVs might be used for sea denial, it becomes apparent that the effect of UCUVs is very similar to the effect of mines.¹⁵ The asymmetric employment of mines allows low-capability forces to effectively challenge the most powerful navies, leveling the playing field. Use of a MIW template against UUVs, however, is a culturally unconventional approach, and furthermore, the MIW template has shortcomings of its own against the kind of dynamic threat that UCUVs will present. MIW doctrine is based around several key assumptions, which UCUVs will challenge.

MIW generally assumes that mines are static in location. While some mines can use techniques such as remote detonation, floating/sinking, etc, they are still primarily *fixed* in location. While Free-floating mines exist, despite legal prohibitions to their unrestricted use, even free-floating mines can generally be *localized* to an area of uncertainty, based on currents, tides, and patterns of mine laying, enabling Tactics, Techniques and Procedures (TTPs) to facilitate operations even in spite of their presence. UCUVs, in contrast, can operate almost anywhere.

The assumption that mines are static is breaking down with technological evolution, however. Some modest *transiting* mobile mines exist, and continue to be further developed. While the range of such mines still makes them limited in effectiveness when compared to UCUVs, the similarities between mobile mines and UCUVs are unmistakable, as CBSA's Robert Work has noted.¹⁶ Developments in mobile mine technology challenges MIW in ways that will closely resemble the challenges of UUVs.

Another assumption of MIW is that the primary function of mining is for Anti-Surface Warfare (ASUW) and ASW, and specifically, against ships in the immediate vicinity of the mines. UCUVs, on the other hand, while likely sharing ASUW as a primary mission, might also be used to accomplish significant effect in strike warfare or electronic warfare (EW). Employing a Land-Attack Cruise Missile (LACM) or Electronic Warfare (EW)

package on a UCUV is only modestly more challenging than employing a torpedo. Indeed, strike and EW packages are already employed on manned submarines, which will facilitate efforts to employ them on UUVs.

Finally, another key assumption of MIW is that the act of mine laying can be detected. Effective MIW can be seriously challenged by covert mine laying. However, TTPs exist to address this challenge through "Maritime Domain Awareness" based on continuous observation of the operating patterns of neutral/merchant shipping that might be used for covert mining. This is resource intensive, and generates only limited freedom of action for friendly forces, but can still be effective in keeping open the sea lanes to critical SPODs. For UCUVs, such techniques will be far less effective.

While these mismatches are significant, the most serious problem with depending on a MIW approach to counter UCUVs is that, put bluntly, the U.S. is not very good at MIW, even today. Technologies to effectively detect mines are elusive, and the sheer quantity and diversity of mines on the marketplace challenges effective MIW. An unfavorable cost balance, with mine countermeasures costing far more than the mines themselves, further challenges effective MIW. UCUVs will only exacerbate the current problems of U.S. MIW. Clearly, MIW does not provide a suitable approach to address the UCUV vulnerability.

4.3. A New Paradigm- the convergence of ASW and MIW

UCUVs exploit the gap between ASW and MIW templates. The operational flexibility, low detectability, and potential quantity of UCUVs threaten to overwhelm ASW practices, while their mobility, range, and capability challenges MIW. The evolution of UCUVs, from a submarine genesis towards resembling both submarines and mobile mines, demonstrates the convergence of the spectrum of undersea threats. This convergence calls for a synergistic, integrated undersea warfare approach inclusive of both MIW and ASW.

In what appears to be pure happenstance, a movement for organizational synchronization of these two warfare areas is indeed already underway. On 1 October 2006, the Navy's MIW

(COMMINEWARCOM) and ASW commands (FLTASWCOM) were merged into the new Naval Mine and Anti-Submarine Warfare Command (NMAWC). The drivers for this merger were, however, NOT based on a sense of operational synergy between the warfare areas. Rather, programmatic synergies— in advocacy, training, and resourcing—drove the merger, which has been met with underwhelming support from both communities. Prominent naval analyst Milan Vego notes “this reorganization was generally poorly received by many mine warfare professionals, mainly because of a concern that ASW will receive far more attention and resources than MIW. Based on the Navy’s traditional neglect of MIW, these fears are not ungrounded. It is also hard to see the reason, apart from saving money, for merging and thereby blurring the lines between ASW and MIW.”¹⁷

However, as the case of UCUVs illustrates, there are benefits beyond saving money. The NMAWC merger could facilitate the closing of a looming gap in operational art. NMAWC already has a vision for the advancement of Theater ASW, as the operational-level *bridge* between tactical level and theater level success in ASW.¹⁸ The integration of MIW into ASW at NMAWC creates the opportunity to transform this into an integrated theater ASW/MIW effort.¹⁹ This combined effort could be much more effective at addressing the operational level actions needed to counter the challenges of ASW, MIW, and UUV threat, which are converging in their technology gaps, methods of employment, and nature of risk.

5. Recommendations for Action and Further Research

While NMAWC might serve as a focal point, much broader effort must be applied to regain superiority in the undersea environment and counter a broad spectrum of undersea threats. General awareness of acute shortcomings in both ASW and MIW has failed to generate a sustained commitment to this objective. The potential of UUVs to give an even broader range of adversaries a powerful sea denial capability provides even more urgency. The program to address this threat should include technology investment, TTP development, operational reorganization, and revision to plans and planning to take UCUVs into account.

While technology investment is not a panacea, the right investments can be of great benefit. Investment should be made into systems to detect UUVs, and to neutralize them. UUV detection is inherently challenging, and payoff of investment is by no means guaranteed. This investment should include deployable fixed-array systems that can be placed in strategic choke points, and non-acoustic ASW (NAASW) techniques. The potentially large quantity of UUVs that a potential adversary might simultaneously employ also warrants investment specifically in neutralization technology. Current ASW neutralization approaches—especially torpedoes—are ill suited to address the quantity of UUVs that might be inbound on U.S. assets. In this respect, mine neutralization options—especially systems such as the Rapid Airborne Mine Clearance System (RAMICS) supercavitating machine gun—might be better than ASW weapons.

Organizational and procedural steps are as important as technology investment. Recent trends towards the establishment of a *theater ASW* commander could be broadened, from an ASW specific charter to include the entire spectrum of undersea threats—submarines, UUVs, and mines. This would improve operational-level preparedness, and better assessment of risk to the Joint Force Maritime Component Commander's (JFMCC's) forces. Intelligence functions must ensure that the JFMCC receives an assessment of UUV quantities and capabilities in potential adversaries Orders-of-Battle (OOBs), as well as warning of adversaries' intentions for use of UUVs to create operational surprise. HUMINT will be especially important in this respect, given the low SIGINT/MASINT footprint of UUVs both in development and operations.

Logistics planners will need to incorporate realistic assessment of threat posed by UUVs into their plans and processes. Even if the technology and organizational steps are embraced, the threat of UUVs will likely only be partially mitigated. Given the variety of actors that might employ UUVs, and the difficulty of detecting and neutralizing them, logistics planners will likely have to make substantially more provision for combat losses of sealift assets than is currently the case. This will likely have the perverse effect of requiring *more* sealift assets, thus giving UUVs that many more targets. The use of large maritime Pre-positioning ships (MPS)—which tend to operate in very localized areas—should also be

questioned, as their operating patterns make them easier to target with low-end UCUVs. The impact of a loss of a ship of the size of a MPS would be devastating. Logisticians will also have to take into account significantly more risk in operating in *friendly* home waters and SPOEs, and likely additional time required to operate in patterns to address this risk.

Considerably more research is needed into the threat posed by UUVs. Almost the entirety of current literature on UUVs is written from a perspective of blue-force employment, with very little focused on potential asymmetric uses. This paper has limited its scope to describing the effect of UUVs at the operational level of war, it has not explicated the potential use of UUVs to attack non-military targets—notably, critical U.S. undersea infrastructure, or homeland security targets. This is not to understate these significant strategic vulnerabilities²⁰ which will further encourage investment in UUVs by adversaries, especially rogue states or non-state actors.

Finally, this paper has not delved into the significant ways in which ROE constraints might severely limit an operational commander's courses of action (COAs) in responding to a UUV threat. Historically, ambiguities in maritime law regarding submarines have led to costly missteps in the promulgation of ROE, and UUVs provide even more complicating factors. Current U.S. doctrinal approaches, as exemplified in NWP 1-14M,²¹ threaten to create significant problems by effectively treating UUVs exactly like manned submarines, instead of like mines. As this paper has demonstrated, such an assumption is ill-founded.²²

6. Conclusion

UUVs will present a formidable asymmetric threat to U.S. Operational Art in the coming decades, potentially becoming a premier tool for *sea denial*. While armed UUVs—UCUVs—are not yet a prominent feature in the order of battle of potential U.S. adversaries, their arrival is only a short matter of time; few technology barriers stand in the way of the proliferation of low cost, capable UCUVs. Because they are free of many of the operational constraints that have limited employment of manned submarines, UCUVs will introduce even more threat into the already vexing ASW problem that confronts U.S. planners. With greatly expanded operational range, UCUVs threaten to give even minor *regional*

actors a global strike capability and threaten the very concept of a *regionally contained war*.

U.S. shortfalls in addressing the threat of UCUVs are similar to those it has in delivering effective MIW. Like mines, UCUVs threaten to become a highly effective tool for sea denial in the hands of low-end nations and non-state actors. These vulnerabilities across the spectrum of undersea warfare illustrate a systemic shortcoming in operational art. Particularly vulnerable to the asymmetric employment of UCUVs are supporting functions such as sealift as part of operational sustainment. The U.S.'s considerable investment, in both lives and dollars, to create a powerful maritime capability are at significant risk if the threat of UUV-enabled undersea warfare is not fully appreciated and diligently addressed.

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THE ROLE OF NUCLEAR SUBMARINES IN NAVAL DIPLOMACY

by LCDR Eray Ekin, Turkish Navy

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INTRODUCTION.

When we look at history, we can easily see that besides their conventional missions, armed forces have taken active roles in the application of international and domestic policy. As an instrument of policy, the US Navy played an important role in international disputes and became an indispensable part of US policy because of its mobility, tactical flexibility and wide geographic reach.¹ For these reasons, US naval forces took part in 177 out of 215 recorded incidents of US military diplomacy between 1946 and 1975.²

Flexibility, endurance, firepower, mobility, survivability, and the ability to transit to crisis areas without any restriction -freedom of open seas- made naval forces the most important military player of diplomacy. In this context, gunboat diplomacy or naval diplomacy is used effectively in the diplomatic arena for gaining political objectives of states at peace or war. Maybe Nelson described the role of navies the best, saying, "I hate your pen-and-ink men; a fleet of British ships of war are best negotiators in Europe."³

DEFINITIONS

What is the meaning of naval diplomacy? The answer changes from author to author. In order to provide understanding to the meanings of these definitions, the author will refer to some examples from different authors and try to find some similarities between definitions. One of the best known authors about naval diplomacy is James Cable. He describes naval diplomacy as:

"... the use or threat of limited naval force, otherwise than as an act of war, in order to secure advantage or to avert loss, either in the furtherance of an international dispute or else

against foreign nationals within the territory or jurisdiction of their own state.”⁴

And Geoffrey Till also describes naval diplomacy as below:

“..... Is a relatively new phrase covering maritime activities at the less dangerous end of the spectrum of procedures which one country may use to influence the behavior of another. The full spectrum ranges from uninhibited military attack at one extreme to routine diplomatic persuasion at the other, and it has no discontinuities; diplomatic activities merge imperceptibly into threats and acts of war.”⁵

These two definitions highlight the following attributes of naval diplomacy:

- The aim of the activities is to affect the policymakers' decisions.
- The spectrum of naval diplomacy is very broad.
- The spectrum can range from benign port visits to coercive use of the forces.⁶

What kind of assets do ships require to support the mission of naval diplomacy? Professor Ken Booth gives the answer to this question as Versatility, Controllability, Mobility, Projection Ability, Access Potential, Symbolism and Endurance.⁷ As will be shown, nuclear submarines have these capabilities. As a result, nuclear submarines will have a significant role in naval diplomacy in twenty-first century.

ADVANTAGES AND DISADVANTAGES OF NUCLEAR SUBMARINES AS AN INSTRUMENT OF NAVAL DIPLOMACY.

For explaining the advantages and disadvantages of nuclear submarines as an instrument of naval policy, the author will use the seven basic assets which are described by Professor Ken Booth.

Versatility

Versatility refers to the ability of ships to perform different types of tasks. Today's nuclear submarines execute the following missions: Sea Control, Conventional Deterrence, Nuclear Deter-

rence and Presence. With OHIO class SSGNs able to host, launch, and recover over 100 Special Operations Force troops, US nuclear submarines now have the ability to conduct effective SOF operations in terms of limited force. Also, "in diplomatically sensitive situations where avoiding a public confrontation is desirable, the covert deployment of SSN may clearly be preferable to taking the more provocative step of dispatching less stealthy units or large concentrations of forces."⁸

Controllability

Controllability means keeping the escalation of a situation under control. Booth explains this asset. "Various combinations of ships are well suited to climb the rungs between the lowest maritime confrontation and the highest level of use of force."⁹ Surface ships have limited ability to conduct missions covertly. So, whether they are responding to a crisis as single units or as a fleet they have greater potential to escalate the situation. As an escalation instrument, submarines are more suitable than surface ships for controlling the situation. Because submarines can conduct covert operations, they can execute a variety of missions without escalating the crisis. Conversely, any type of surface ship—fast patrol boat or aircraft carrier—because of its visible presence can escalate the situation. Finally, SSBNs are unique platforms for nuclear deterrence. If the USA has to escalate a crisis, controllability of SSBNs and their strategic deterrent would be a critical part of the diplomacy.

Mobility

One of the most important assets for naval diplomacy is mobility. Any country which deploys its assets quickly and without restriction will also take the political advantage. Nuclear power improved the mobility of nuclear submarines and gave them a speed advantage when compared with surface ships. Nuclear submarines with more than 30 knots submerged speed have an incredible superiority over surface ships. Submerged mobility also reduces the negative impact of weather and sea conditions on transiting submarines. Nuclear submarines' inherent mobility advantages were demonstrated by the Royal Navy during the Falklands crisis, as described by the British Ministry of Defense:

"The SSNs were flexible and powerful instruments throughout the crisis, posing a ubiquitous threat which the Argentines could neither measure nor oppose. Their speed and independence of support meant that they were the first assets to arrive in the South Atlantic, enabling us to declare the maritime exclusion zone early."¹⁰

Projection Ability

One of the advantages of naval forces at naval diplomacy is power projection. Naval forces can efficiently transfer sea-based firepower as well as land forces to the crisis area. Aircraft carriers, amphibious ships and surface combatants such as guided missile cruisers and destroyers are some of the main naval assets for power projection. Aircraft carriers, in particular, are still the key element of US naval diplomacy because of their superior power projection capabilities. For example, the US Navy has used aircraft carriers as an instrument of naval policy during 78 incidents within the last 56 years. The first question of US presidents when entering a crisis has often been, "Is there any aircraft carrier close to that region?"¹¹

Submarines also have power projection capability, employing Tomahawk cruise missiles and SOF teams. With OHIO class SSGNs able to launch up to 154 Tomahawk missiles and embark up to 66 SOF troops¹², the submarines' projection ability is radically enhanced. Although Cable described submarines as *"ill-adapted to most forms of gunboat diplomacy,"*¹³ he also emphasized the unique role of submarines conducting special operations.

*"Even the submarine might come into its own for specialized operations—landing a small party unperceived in order to kidnap or rescue a leader...."*¹⁴

The changing structure of the threat—from blue water to brown water—has made the littoral waters a dangerous environment for overt operations by aircraft carriers and other surface ships. As a result, a submarine's ability to deploy and operate covertly will make it the most important instrument of naval policy in the twenty-first century.

Access Potential

Naval forces have become the key instrument of policy within the armed forces. 'Freedom Of The Seas' made it easier to transit

naval forces to crisis regions without any restriction. But today, potential threats posed to US naval forces by hostile submarines, mines, and land based anti-ship missiles have made the movement of sizeable armed forces across the seas dangerous. Because of these challenges, the stealth and survivability offered by submarines will be a more important consideration to US policymakers. Submarines' relatively invulnerability will allow US policymakers to employ military force without the fear of casualties that is attendant to other force employment options.¹⁵

Symbolism

The big, visible character of warships made them the symbols of a country's intentions and policies. Warships are still the symbols of national policies. But for submarines, visibility is synonymous with vulnerability. Remaining undetected and stealthy is vital for successful submarine operations. According to Cable's point of view, limited naval forces must remain overt. He argues this approach, stating, "*A submarine cannot communicate a threat without making its presence known.*"¹⁶ With a narrow perspective, maybe this is correct; but nowadays, nuclear submarines which are participating in Maritime Interdiction Operations, such as Operation Active Endeavour, are conducting hailing to merchant ships, making their presence known. And through port visits or by announcing a nuclear submarine deployment to a region, the submarine can provide effective presence while continuing her operation in a stealthy manner.¹⁷ At the same time, nuclear submarines, with their high speed advantage, three dimensional operating capabilities and sophisticated counter-measures systems, will not make themselves vulnerable if their presence becomes known by the threat countries or ships.

Endurance

Warships' endurance characteristics are a kind of trump card for policymakers during prolonged crises. Warships can deploy for long periods with the support of logistic ships. The advent of nuclear power changed the type of support radically. Now, nuclear powered ships can stay at the crisis region without fuel replenishment. But, even if this is the case, they need food and other important supplies. However, a nuclear submarine does not need to

withdraw to a naval base or a specific area for replenishment which will affect the efficiency of the operation. Nuclear submarines can stay at the crisis region without taking any logistic support for up to six months. This feature gives policymakers flexibility to conduct their policies for a long period. Conducting operations without the support of auxiliary ships also gives flexibility for planners to plan the operation without as many restrictions. When one compares nuclear submarines and aircraft carriers, one realizes that nuclear submarines have a remarkable advantage over aircraft carriers in terms of endurance. And, in the twenty-first century, superior endurance will be a primary reason for policymakers to prefer deploying nuclear submarines to crisis regions.

USE OF SUBMARINES IN NAVAL DIPLOMACY

When one looks at history, one can easily see that Soviet naval diplomacy depended mainly on submarines. This was because, according to the Soviet view, the main instrument of US naval diplomacy was the aircraft carriers; and the main Soviet instrument to counter these aircraft carriers was submarines.¹⁸ Confrontations between the US and Soviet navies since the 1960s validate the importance of submarines to Soviet policies as a means of countering American aircraft carriers. During these crises, Soviet submarines operated covertly and posed a threat against US forces without making their positions known. These applications of naval policy by the Soviets disprove Cable's argument that the "submarine is inherently ill-suited to the exercise of limited naval force."¹⁹

Submarine Deployments to Cuba

After the Cuban missile crisis, Soviet submarines began to visit Cuban ports. These visits were mainly different than bona fide port visits and were actually serving the Soviets' political goals. As stated by Dismukes, these political goals can be collected under three topics: (1) the Soviets wanted to undermine the 1962 US-Soviet agreement forbidding the placement of ballistic missiles in Cuba; (2) they wanted to support their positions at the SALT negotiations and would use these port visits as a trump card for banning the US ballistic missile submarines from Mediterranean; and (3) they wanted to show their support for the Cuban regime.²⁰ When looking at the Soviets' political goals with these submarine

deployments, it is obvious they targeted to achieve their political objects using submarines overtly, which is different than their conventional usage.

USS SAM HOUSTON's port visit to Izmir (1963)

In 1961, the US deployed 15 Jupiter ballistic missiles to Turkey, aimed at cities in the western USSR. To counter this deployment, the USSR deployed ballistic missiles to Cuba. After their deployment, the Soviet ballistic missiles were discovered by the U-2 spy flights. With the discovery of the missiles, a crisis between the US and USSR started. To end the crisis, the USSR proposed removing the missiles on Cuba in exchange for the removal of the Jupiters from Turkey. But the Turkish government had stated its opposition to the removal of the Jupiter missiles. At the end of the crisis, the Jupiter ballistic missiles were removed from Turkey. After the crisis, the submarine USS SAM HOUSTON visited Izmir, Turkey. With this port visit, the United States showed that her strategic deterrence remained committed to the defense of Turkey.²¹

Soviet Submarines' Patrols in the Atlantic and Pacific Oceans

Yankee class SSBNs equipped with the 3,000 kilometer range SS-N-6 normally had been operating in the Atlantic and Pacific Oceans. But, in 1984, the Soviets also deployed Delta class SSBNs equipped with the 9,100 kilometer range SS-N-8. The change in target ranges had no effect on the military plans because those targets were also covered by Yankee class SSBNs. The meaning of this change was mainly political. Delta Class SSBNs patrol change was a reprisal to US deployment of medium-range nuclear missiles in Western Europe.²² Ditzler makes this argument stating:

*"This effort could be considered a successful case of "signaling" in that Soviet political objection to the NATO INF deployment was conveyed in an "expressive" use of limited naval forces."*²³

When the INF treaty missiles were removed from Europe, the Delta class SSBN deployments to Atlantic and Pacific Ocean stopped. The Delta Class SSBN deployment to Atlantic and Pacific Ocean had been a clear and understandable reply to US missile deployment to Europe.²⁴

CONCLUSION

The unique status of naval forces within the armed forces as an instrument of diplomacy created a new concept called "naval diplomacy". Naval diplomacy can be defined as other than the act of war, use of naval forces for changing and affecting the foreign decision makers' thoughts and acts according to our national interests. An investigation of the historical background of naval diplomacy indicates that surface ships have been the main instrument of this policy.

Submarines' entry into the military arena at the beginning of the twentieth century, with their stealthy character, made them mainly an instrument of war rather than diplomacy. Capabilities of conventional submarines were limited in terms of endurance and survivability. But, after the 1950s, the advent of nuclear propulsion radically changed the face of submarines, giving them advantages in speed, fire power (ability to launch ballistic or Tomahawk missiles) and multi-purpose usage (mine laying, SOF-submarine operation) during conflicts.

The threat faced by naval forces also changed radically after the collapse of the Iron Curtain. In other words, threats shifted from blue waters to brown waters, and the littoral became the new arena for conflict. At the same time, asymmetric threats and the threat posed by non-democratic countries altered the roles and missions of naval forces. When looking into the military capabilities of Iran, North Korea or Hezbollah, it becomes apparent that submarines, land based anti-ship missiles, mines, and guided missile fast patrol boats are the main threats originating from these countries or organizations.

Such threats made littoral waters unsafe places for aircraft carriers and surface ships as an instrument of naval diplomacy. For example, the terrorist attack against USS COLE illustrates why surface ships (including aircraft carriers) will be more vulnerable and will not be the primary instrument of naval policy in the twenty-first century. The deployment of USS COLE off the coast of Lebanon in February 2008 as *a show of US support for regional stability because of concern about the situation in Lebanon* is another example. Instead of positioning just outside Lebanese territorial waters, USS COLE anchored 60 miles offshore, invisible to the people of Lebanon and reducing the symbolic impact of her

presence. The reasons for stationing far off the coast may include a desire not to escalate tension in the region as well as concerns about the threats posed by Hezbollah anti-ship missiles.

But with the altering of threats, the capabilities of nuclear submarines also changed. The Ohio Class SSBN modernization program is a unique example of these changes. After the modernization, these submarines had the ability to launch 154 TLAM and to deploy more than 66 SOF soldiers on board. This means that with their stealthy characteristics and speed advantage, submarines can deploy to crisis regions rapidly and can be positioned close to threat countries' shores for launching Special Forces or TLAMs to targets according to objectives of the policy. Or, their presence can be used as a trump card by policy makers to achieve diplomatic goals. This new century with new threats, highly sophisticated and capable submarines will be the nuclear submarines' century. In future crises, the first question of the US President may likely be "Is there a nuclear submarine in that region?"■

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RADIO CORPORATION OF AMERICA (RCA) ORIGIN AND THE NAVY

by Mr. John Merrill

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Introduction

Rear Admiral William H. G. Bullard "In early April 1919... determined that if possible this new form of international communication should remain in the hands of American citizens..."¹

With new radio technology and radio proven to be a strategic asset, a long World War I (WWI), and its aftermath jointly contributed to the incorporation on October 17, 1919 of RCA with General Electric (GE) as the major stockholder. For the following sixty-seven years, this new radio communications entity progressively became one of the largest and most influential electronics companies of the 20th century.

This essay focuses on political and technical issues, as well as the Navy's technology goals for radio in 1919 that led to the founding by private industry of RCA. Also addressed are the consequences, at that time, of the introduction of the Alexanderson alternator radio signal source for long distance transmission, as it was the pivotal item that brought about the start of the new company. The events leading up to the formation of RCA are the primary focus.

At the start of WWI, there was further emphasis on radio's viability from England's alleged first offensive action of the war, the cutting of Germany's five transatlantic cables that ran through the English Channel. Cable severing included the cable between United States and Germany. German submarines then cut Britain's undersea cables, thus creating further emphasis on radio. The widespread use of radio introduced problems from signal interception.

World Wide Radio

Germany, seven hours before the declaration of war at midnight on August 14, 1914, flung round the world on its chain of wireless stations the vital message to its mercantile marine: 'War declared on England, make as quickly as you can for a neutral port.' This terse dispatch unquestionably saved Germany many millions of pounds of property and secured for possible future use a fleet of passenger and cargo boats which might yet play a great part in her recovery from war's ravages."--"Long Distance Services", *The Yearbook of Wireless Telegraphy and Telephony*, 1916.

With the importance of radio and the expanding war, a Navy goal aimed at perfecting existing Navy radio facilities was established. A new board to work toward this goal (the Naval Communications Service) was authorized in May 1915. Then Captain William H. G. Bullard, who had earned distinction in the electrical and radio field, was appointed as the first director. It was Bullard's actions in 1919 that ultimately brought about the creation of RCA.²

By 1919, a number of improvements of radio and its associated technology with their uses during the more than four years of WWI supported Admiral Bullard's comments above. Wartime experience included recognition of the British international cable monopoly and the growing British Marconi international radio systems. The British Marconi Wireless Telegraph Company of America subsidiary's broad and growing interests further favored consideration of American owned and operated international radio systems.

Setting

As radio began to emerge at the brink of the 20th century, merchant shipping radio ship-to-shore, shore-to-ship, and ship-to-ship expanded. The US Navy saw radio as improvement over searchlight, flag signaling and the use of pigeons. Early US Navy attention to Marconi's wireless communications began in 1899 after the successful Marconi demonstration with ships of the Royal Navy communicating up to distances of 74 nautical miles. To accommodate American commercial needs, Marconi established the above-cited Marconi America November 22, 1899. In the ensuing years,

Marconi continued to grow in United States and abroad. Even though the majority of the stockholders of the Marconi subsidiary were American the largest holdings and company control were British.

At the beginning of the 20th century, England was recognized as dominant in cable communications coupled with an established sea transportation monopoly. Further, there was a perception due to Marconi's expanding wireless holdings that England had ambitions to be in control of international radio communications.

In 1903, Germany held the First International Wireless Conference at Berlin to formalize international protocols for the widening use of radio. The meetings met with success in some areas but were deadlocked on the issue of message exchange by competing wireless companies. Marconi took a strong position against accommodating exchange. This position provided Marconi with a virtual monopoly. In the years ahead, Marconi's monopoly became a significant issue in the establishment of RCA.

In 1904, President Theodore Roosevelt addressed the growing interest in radio. He established the Roosevelt Board to prepare recommendations for coordinating government development of radio services. The Board's report proposed assigning most of the oversight of government radio to the Navy Department, plus significant restrictions on commercial stations.³ Although never becoming law its recommendations were in effect adopted, especially by the Navy Department. "The dominance of the Navy in this field was established and it was enabled to launch its own radio system, one for which Congress saw fit to appropriate many millions in the following years."⁴ A remark by Rear Admiral Bullard in 1923 attests to the Navy's interpretation of the Roosevelt Board's findings "The Navy Department has always maintained the rights conferred by it and has always assumed the obligations demanded by it."⁵

Efforts at that time by the Navy to negotiate with Marconi regarding communication systems demonstrations and possible radio communication system purchases did not go smoothly. Marconi with dominance in radio did not sell the systems but used a royalty leasing arrangement with stipulations. This was not acceptable to the Navy. Over the next decade, independent of Marconi, the Navy guided and assisted the development of radio in

this country. Where possible the Navy tended to award contracts to American companies. During this period, Marconi and Telefunken in Germany made the best radio systems.⁶

A quote from naval historian Captain L. S. Howeth points out the Navy's view of dealing with Marconi: "The nonacceptance of unwarranted dictatorial authority led to a wider search, the exercise of ingenuity, and the more rapid development of a competitive market which benefited the Navy and the rest of the world."⁷

Not long after the sinking of the TITANIC, Congress in August passed what is known as the Radio Act of 1912. The Act broadly regulated how radio was to be used until 1927. A provision related to war stated "...that the President of the United States in time of war or public peril or disaster may cause the closings of any station for radio communication and the removal therefrom of all radio apparatus, or may authorize the use or control of any such station or apparatus by any department of the Government, upon just compensation to the owners." It was from this Act during War years 1914-18, that important steps were undertaken to assure government control of radio, which brought the Navy into substantial contact with commercial and military uses of radio.

In 1914, President Wilson ordered the Navy to take over "one or more high-powered radio stations within the jurisdiction of the United States and capable of transatlantic communications." Under this action, the Navy took control of two German commercial radio stations, one German-owned at Tuckerton, New Jersey, and one at Sayville, Long Island, owned by an American subsidiary of a German company. They were operated as a commercial enterprise.⁸

Immediately after signing the United States declaration of war against Germany, April 6, 1917, President Wilson directed the Navy by executive order to take over any radio stations it might need, and to close all stations that were not necessary and operating them for the duration, (except Army field activities). The Navy took over 53 commercial stations and closed 28. Most of the remaining stations were the United States radio facilities of the American Marconi Wireless Company.⁹ At the end of the war, the Navy was involved with 111 of 127 commercial stations.¹⁰

After nearly five years of war, the Navy was well aware of the effectiveness of radio for military needs of Army and Navy that came to attention during WWI. In the months after the armistice,

there was a growing realization in some quarters that United States leadership in the rapidly evolving field of radio could be seen as a national goal. Senior Washington government personnel took initiatives to search for ways to bring this technical leadership to the country. The end of the war found wireless communication entirely under the government. A bill was introduced in Congress, November 1918 to perpetuate government monopoly of all wireless communications.¹¹

Path to RCA

Certainly, it was the collective radio-related events of the war years that contributed to the perceived need for national technical leadership in the emerging and broadening use of wireless. By the end of the War, senior government levels in Washington were well informed about radio by observation, and in some situations actual transatlantic use of radio. The Navy, controlling a large number of commercial radio stations and their own radio operations for five years, had an intense intimacy with all the current technical and operational aspects of radio, military and commercial.

In May 1915, Guglielmo Marconi had initial discussions with GE's vice president and general council Owen D. Young* in New York City and visited General Electric in Schenectady, New York, to view the newly-developed Alexanderson alternator as a signal source for long distance radio communication. Marconi agreed to purchase exclusive rights to the alternator for close to \$4 million.

When the United States entered the war, negotiations were put aside. With the Navy in control of New Brunswick Marconi station, GE did

deliver a 50kW alternator and later in the war a 200 kW alternator.¹²

From the beginning of the war, Secretary of the Navy Josephus Daniels, who was appointed in 1913, strongly held the view that the Navy should control the ether. Secretary Daniels was also disposed toward government ownership of armor plate factories and of telephones and telegraphs. At the end of the WWI he made a

*Young's abilities were well known and from 1924 to 1932, his name figured prominently as a possible nominee for president; but he refused to encourage hat-flingers.

serious attempt to have the Navy control all radio transmitters in the United States.

The end of the War found wireless communication stations still under the government. In this regard, a bill was introduced in Congress (November 1918) to perpetuate government monopoly of all wireless communications under the Navy. This was in consonance with Daniels' position. It should be noted that many foreign countries had early adopted the policy of government ownership and operation of all radio activities. With heavy opposition in Congress, the press, and the public, on January 16, 1919, the bill was tabled.¹³ Later in July 1919, Daniels addressed letters to the President of the Senate and Speaker of the House of Representatives, each directed toward government monopolization of radio under the Navy.¹⁴ Later by presidential executive order the radio stations were returned to their owners on March 1, 1920.¹⁵

A comment in the November, 1919, issue of Wireless World is of interest, "...it is not likely that Congress would yield to any proposal leaning toward Government ownership of this method of communication...stating that a compromise had been suggested looking to the establishment of an American controlled company, operating under a Government authorized monopoly."¹⁶

Alexanderson Alternator

Of special note and relevance to RCA origins is the invention of the Alexanderson alternator. Alternator research began at GE in Schenectady in 1903 when inventor Reginald Fessenden, an inventor, asked GE to build an alternator. Starting in 1904, Ernst Alexanderson, an engineer at GE and in due course a prolific inventor, worked on developing the alternator. The device was delivered in 1906 when Fessenden successfully transmitted voice at 50 kHz with a radiated power of 1 watt to distances of the order of 200 miles. By 1915, Alexanderson had perfected a high frequency high power continuous wave signal generator.

GE developed a continuous wave alternator and receiver communication system. An article in The Electrical Experimenter (August, 1916) pointed out that the electrically driven alternator produces 100 KW at a precise frequency of 50,000 cycles per second and no harmonics. Two 50 kW GE alternators were installed at the American Marconi station at New Brunswick, New

Jersey. The 50 kW alternator's performance was superior to that of an arc transmitter with 100 kW rating.

In January 1918, a GE 200 kW alternator operating at 22.05 kHz was installed for Navy use at the New Brunswick station owned by American Marconi Wireless. This equipment carried the bulk of the traffic to Europe for the remainder of the war and for a period thereafter.¹⁷

The GE alternators quickly became the clear first choice for long-distance radio service. The alternator performance easily surpassed the current preferred signal choices of spark and arc systems. By 1919, the General Electric Company, after an investment of the order of \$1 million, was ready to go into production of the successful high frequency alternator. It was possibly the most promising single piece of apparatus available for transoceanic communication.

In addition to the alternator as a significant transmitting device available at the end of the war, additional important radio-related technology developments included mica condensers, vacuum tube oscillators, signal detectors, amplifiers, transmitters and receivers. The level of development and complexity of the vacuum tube was in the early stages of what the future brought. These advances came from the technical laboratories of Westinghouse, General Electric, AT&T, and others.

Starting in the early years of research and development of radio technology, litigation between and among inventors and technical companies of radio technology was a time wise and fiscal problem barrier to progress. Soon after the declaration of war a federal government moratorium on radio patent rights and litigation for the duration of hostilities was invoked, and the patents of the major companies involved with radio in the United States were merged to facilitate the war effort.¹⁸

Alternator Anticlimax

The alternator, enthusiastically pursued during and immediately after WWI, was soon replaced by the vacuum tube. By the late-1920s, successful high power transmitting tubes with water-cooled anodes led the Navy and others to abandon high frequency alternators and their more complicated mechanical requirements. The advent of the vacuum tube as a signal source soon stopped

alternator production. A number of alternator transmitters continued in use through the 1940s. Regardless of the growing potential and capabilities of vacuum tubes, the GE alternator was recognized from 1916 and for the next few years as the most significant device in long distance radio.

A comment made in 1922 is appropriate, "So, ironically, it turned out that the magnificent Alexanderson alternators, so glowingly reviewed in this article, were actually just a couple of years away from becoming *inefficient, outdated dinosaurs* that would be rapidly overshadowed by far more efficient vacuum-tube shortwave transmitters"¹⁹

1919

At the end of 1918, Congressional action as mentioned previously to invoke national radio monopoly was firmly rejected after much lobbying against it by American radio business leaders, American Marconi, and others including some from academia. It was still unresolved as what to do about the extensive government held private radio transmitting station assets and radio related patents held by the navy during the war. The theme of however this would be resolved was "...take action to safeguard American radio interests."²⁰

Major Players

Personages contributing to the events of 1919 that brought the new company to fruition in October included President Wilson, Owen D. Young (General Electric), Guglielmo Marconi, Commander (later Admiral), Stanford C. Hooper, Admiral William H. G. Bullard, Assistant Secretary of the Navy Franklin D. Roosevelt, and Edward J. Nally of American Marconi.

With the war over and the Paris Peace Conference at Versailles scheduled to begin January 18, 1919, President Wilson sailed on the S.S. GEORGE WASHINGTON and arrived in Paris on December 13. Throughout his four crossings of the Atlantic during the peace negotiations between December 1918 and July 1919, effective use of radio communications took place for the President, demonstrating his ability with radio to be in constant touch with the United States and world affairs. The battleship PENNSYLVANIA accompanying the GEORGE WASHINGTON also was in constant

communication via radio. During one of his westbound trips, the president had occasion to use radiotelephone to converse with Secretary of the Navy Daniels. During his first trip to France, the President received an extensive briefing on world communications and the importance of assisting in the development of wire and radio communications.²¹

While at the Conference, President Wilson visited several of the Allied countries and noted the impact of his worldwide radiotelegraphy broadcast to the German people January 8, 1918. The President's Fourteen Points speech brought about a broad awareness of the content of the speech throughout Europe. The 200 kW Alexanderson alternator at the Brunswick, New Jersey radio facility was the signal source.

In mid-February, the President made a brief return to Washington. At that time a much-quoted comment about his experience in Paris stated "...that there were three dominating factors in international relations—international transportation, international communication, and petroleum—that the influence which a country exercised in international affairs would be largely dependent upon their position of dominance in these three activities."²² Events beginning in March 1919 primarily involving the Navy, General Electric and the Marconi Companies reflect President Wilson's understanding of radio and its importance then and in the future.

Navy and General Electric

In March 1919, British Marconi again entered into negotiations with GE for worldwide exclusive use of the alternator. In the United States the rights would solely be vested in American Marconi. The offer was for 24 units, British Marconi wanted 10 and American Marconi 14, for \$3,048,000. GE preferred a royalty basis and refused. Marconi countered with an additional \$1,000,000 to defray development costs. The sale was impending. This gained the attention of the Navy.²³

At the request of Secretary Daniels, Commander Stanford C. Hooper of the Naval Radio Service asked GE to withhold action regarding the sale of the alternators to British Marconi, until after Admiral Bullard (newly recently appointed Director of Naval Communications) arrived for duty in Washington. Bullard, recently in Paris with President Wilson, reported for duty March 31. Several

days later, Hooper apprised Bullard about the negotiations of the pending GE alternator sale to Marconi. The discussions included ways to block the sale of the alternators to British Marconi.

On March 29, 1919, Owen D. Young of GE wrote to the acting Secretary of the Navy Franklin D. Roosevelt, and provided details of the pending alternator purchase. Roosevelt replied to Young and invited GE officials to confer in Washington on April 11 regarding the sale of the alternators.

In advance of the Roosevelt proffered conference date, a significant two-day meeting was held April 7, 8 with Admiral Bullard, Commander Hooper, and GE managers at Young's office at 120 Broadway in New York.²⁴ Bullard pointed out the President's interest in establishing an American-controlled commercial radio company. The negative aspects of selling the GE alternator to Marconi were highlighted. GE brought up the financial side of recovering the money spent in the long development of the alternator. The meeting concluded with the GE directors voting to stop negotiations with Marconi interests for the alternators and to place the order with a new American company that would the operate United States end of international wireless circuits for both government and commercial traffic.^{25, 26}

With the alternator procurement by Marconi no longer an issue, there still remained the question of how to provide an American company to lead in international communications. One option was a government-backed company possibly chartered and with the Navy in a strong role. Current sentiment was not favorable to that solution.

The subsidiary American Marconi Company during its tenure became the dominant international radio communication and ship-to-shore activity in the United States. As mentioned previously, the company was not acceptable because of its foreign connection with British Marconi and British policies. Marconi policies were noted to be litigious and tended toward monopoly. Young and his GE associates rationalized that a new company would immediately have to compete with American Marconi. The purchase of American Marconi was very important.

In June 1919, a GE representative and Edward J. Nally, manager of American Marconi, sailed to England to negotiate with the Marconi Company for the purchase by GE of American Marconi to

provide a basis for the new private company. On September 5, 1919, British Marconi Company agreed to sell its American interests. GE paid \$3.5 million for the controlling stock.

The New York Times reported on September 4, 1919 the news story that GE would become a stockholder in American Marconi. The article pointed out that GE became interested through having developed the Alexanderson alternator, which was installed at the New Brunswick, New Jersey American Marconi station. This action by GE gained high approval from the Navy Department. The article also stated "It is understood that, however, that if reorganization is undertaken American capital will back the enterprise, so that control will rest absolutely in this country."²⁷

RCA Launched

RCA, as a publicly-held company owned by GE with controlling interest, was granted a charter under the corporation laws of the state of Delaware on October 17, 1919. Significant highly detailed stock, asset considerations, and personnel questions would take additional months to clarify and resolve. RCA's primary responsibility was to maintain radio communications circuits to and from the United States, including ship-to-shore. With the GE purchase of American Marconi came exclusive rights to communicate with British Marconi stations and with most other stations in Europe. RCA manufacturing facilities would come at the end of the next decade. On November 20, 1919, the American Marconi Company was officially merged with RCA.

Agreeing not to become a manufacturer, RCA had exclusive rights to GE-manufactured radio hardware. With access to the GE Alexanderson alternator's power for transoceanic communications, the new corporation had a virtual U.S. monopoly in long-distance point-to-point communications.²⁸ One of the requirements for American control was met by the certificate of incorporation that provided "no person shall be eligible for election as a director or officer of the corporation who is not at the time of such election a citizen of the United States."

The new corporation was underway and by January 1920 was advertising with a World Wide Wireless logo for RCA's Marine Radio Shore Station in New York City with call letters *WNY*. The advertisement announced that the company had exclusive rights to

the radio inventions and extensive research laboratories of the General Electric Company.

RCA greatly benefited from a number of cross-licensing arrangements that provided free use of patents. The licensing began in 1920 and included arrangements involving GE, AT&T, and Westinghouse Manufacturing Company. United Fruit also cross-licensed with RCA. This company held extensive shipboard and shore radio stations in Central America in conjunction with their agricultural activities and ship transportation of their products. The joint use and availability of patents removed barriers that prevented bringing commercial products to market.

In the future, work at RCA successfully moved towards consumer products, radio broadcast receivers, radio broadcast transmission, and research related to military needs, plus the slowly evolving creation of television systems for broadcasting and receiving video signals. Research, hardware production, distribution, and sales provided company focus.

Along with other industries, the national depression beginning in 1929 provided severe challenges to RCA along with other consumer product-based industries. This was further exacerbated with the 1930 anti-trust injunctions against RCA based on the cross licensing of patents with AT&T, General Electric, and Westinghouse. GE was forced to sell its interest in RCA, making the Corporation independent.

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During the post-World War II period through the 1970s, RCA laboratories continued to develop and introduce new technologies related to computers, integrated circuits, lasers and other devices, and solid-state television cameras. With RCA's base in the sales of consumer products, the growing Asian intrusion in the 1970s into the United States electronic marketplace of low price products along with management difficulties, caused the RCA decline to begin.

In 1919, GE paid \$3.5 million to purchase American Marconi and create RCA. In 1986, GE's offering price to purchase RCA was \$6.5 billion. At the time this offering was the largest non-oil merger in financial annals. In a few years, this was followed by a breakup of RCA where the consumer products went to a French company

(Thomson Group) and the RCA Laboratories to SRI (Stanford Research Institute).

Closing Comment

Nationalization of the entire radio industry during WWI provided relief from patent litigation that impeded radio technology development during the first part of the new century. Litigation costs time and money. Radio technology advances during the war and the manufacturing of thousands of radio devices were made possible in an environment where patent infringements were not a concern.

In 1919, as discussed previously, alarm over the possibility of losing the United States rights to GE's Alexanderson alternator for international communications to a potentially monopolistic British-controlled American Marconi and other Marconi holdings required action. It was with the wartime litigation free experience and the drive to fend off Marconi that RCA was created. The purchase of American Marconi removed the foreign factor; the alliance of the leading radio manufacturers and cross licensing of patents initially relieved the litigation aspects of radio hardware manufacturing during the early 1920s.²⁹

Reprise

April 4, 1919, a letter to GE's Young from Assistant Secretary of the Navy Franklin D. Roosevelt, acting for Secretary of the Navy Josephus Daniels, asked Young to confer with naval officials before consummating the Marconi order. Four days later, Admiral Bullard, Commander Hooper, and Young appeared before the GE Board of Directors with the outline of a proposal that would alter the structure of American Communications.³⁰

ENDNOTES

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4. Captain L. S. Howeth USN, (Retired), *History of Communications-Electronics in United States Navy, Bureau of Ships and Office of Naval History*, Washington, DC, 1963, p. 76.

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 27. Archer, *op. cit.*, p. 173.
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 29. Earlyradiohistory.us/1922RTCA.htm
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REUNIONS (continued)

USS ETHAN ALLEN SSBN/SSN 608 Sep 11-14, 2008 Silverdale, WA
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Herb Richardson E-mail: herb.richardson@comcast.net

USS SANDLANCE SSN-660 Sep 18-21, 2008 Portsmouth, NH
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THE LOSS OF THE R-12

by Mr. John Alden

CDR John Alden, a submarine veteran of World War II, is a prolific writer, most notable for his The Fleet Submarine in the U.S. Navy. He is a frequent contributor to THE SUBMARINE REVIEW and is very respected for his thorough and thoughtful commentaries on WW II submarine actions.

SUMMARY

The USS R-12 (SS 89) sank accidentally during exercises off Key West, Florida on 12 June 1943 with the loss of four officers, 24 regular crew members, 12 trainees, and two Brazilian Navy officers. The only survivors were the Commanding Officer, LCDR Edward E. Shelby; officer of the deck LTJG William D. Whetstone; helmsman Sydney H. Pool, S2c; lookout John Kapral, TM3c; and lookout Edward F. Zielinski, TM3c, all of whom were on the bridge at that time. A subsequent Court of Inquiry concluded that "the sinking was probably caused by flooding through an open torpedo tube due to inadvertent, thoughtless, or inattentive operation by a person or persons unknown now deceased," or by failure of the interlocking device. (Opinion 21, p. 135. This and subsequent references are to page numbers in the court's Record of Proceedings dated June 22, 1943 unless otherwise indicated).

To the best of my knowledge, the full story of the R-12's loss has never been publicly disclosed. Based on a careful review of the Commanding Officer's Action Report, the proceedings of the court, the testimony of witnesses, the plans and type of construction of the boat, and personal experience with submarines, I believe that the court failed to recognize the strong possibility of structural failure and improperly concluded that responsibility for the sinking was chargeable to one or more lost members of the crew.

BACKGROUND

The R-12 was one of many older submarines returned to service during the build-up prior to U.S. entry into World War II. Recommissioned on 16 October 1940, she operated out of New London, Coco Solo, St. Thomas, and Guantanamo Bay until

February 1943. Following an overhaul at New London, she was ordered to Key West. Arriving on 11 May, she conducted exercises under the operational control of the Fleet Sound School along with other R-boats regularly stationed there, but was not formally transferred to Submarine Division 12 until 7 June, five days before being lost.

CIRCUMSTANCES OF THE SINKING

According to LCDR Shelby's Action Report (SS-89 Serial 002, 16 June 1943), the boat had spent the morning conducting sonar training operations with USS CORAL (PY-15) and came to the surface at about noon in order to shift to an adjacent area and perform torpedo practice with the target vessel, EAGLE 56 (PE-56). Lunch was being served and the morning watch section was in the process of being relieved. The surfacing procedure was proceeding normally when Shelby went to the bridge, followed shortly by the three enlisted men. At about 1202 the diving officer, LT Roger N. Starks, called up the hatch that Whetstone had heard a bumping sound on the starboard side of the forward battery compartment, and asked whether it had been heard on the bridge. Shelby had heard nothing, and after looking over the side reported that he could see no sign of anything that might have scraped the hull.

Continuing the surfacing procedure, when he saw that the stern was well up Shelby ordered "secure pumping #2, ride the vents on #2 main ballast." He then told LT Starks to pump #1 ballast tank (the forward one) dry in preparation for riding the vents on that tank as well. At about 1212 Starks reported that suction on #1 ballast tank had been lost. Noting that the bow looked a bit low, Shelby ordered that the tank be checked using the high pressure pump. At this point LTJG Whetstone came to the bridge to relieve the captain and Lt. Starks reported that the high pressure pump had lost suction on #1 tank. Shelby check the trim forward and aft, saw that the bow was "about 2" or 3" low, which was normal as the ship was already riding the vents on #2 main ballast," and ordered Starks to ride the vents on #1 ballast tank, start the hull induction blowers, ventilate the batteries into the engine room, and go all ahead standard on the engines. The men on deck then shifted their attention toward fixing the boat's position and heading to the exercise area.

All still appeared normal when at about 1220 the collision alarm sounded and LT Starks shouted up the hatch: "Forward Battery Flooding." Shelby immediately ordered both tanks blown but felt the boat start to tip down by the bow and sink so rapidly that the water had almost reached the coaming of the bridge hatch. Shouting down for Starks to close the lower hatch, Shelby slammed the upper hatch shut. He and Pool then stood on it to keep it from blowing open, but were soon washed off the bridge. Shelby estimated that only about 15 seconds had elapsed from the sounding of the collision alarm until the bridge was completely under water. As he got clear of the bridge, he saw the boat go down at an angle of 75 to 80 degrees with the screws stopped. The survivors gathered together and at 1233 by the captain's watch they observed an eruption of air bubbles, oil, and cork fragments that continued for about 45 minutes. They then helped one another stay afloat until picked up by the submarine chaser SC-449 after being in the water 5 hours and 35 minutes.

CONDITIONS SUPPORTING THE COURT OF INQUIRY'S CONCLUSION

It was agreed by all concerned that the only possible causes of the sinking were flooding through a torpedo tube or by structural failure of the hull in the area of the forward battery compartment. The Judge Advocate's questioning, however, focused most heavily on the torpedo tubes and went into exhaustive detail concerning the operation of the tube doors and the condition of the interlock mechanisms, which had been the subject of a Squadron 7 memorandum of May 7, 1943 titled *Torpedo Tube Operating Gear* that the R-12 had never received.(18) The court also went into detail about an incident the previous day where a leaking torpedo tube drain valve had allowed water to enter the forward trim tank. It asked extensive questions about the state of mind of the torpedomen and the moral of the crew, based mainly on testimony by the boat's yeoman that the leading torpedoman "wasn't feeling very good" and "didn't seem very happy" when the two had spoken the evening before the boat's loss. (64) However, no other witness supported that view. To the extent that the crew was in any way discontented, one member put it best: "I think that any man serving on an R-boat is discontented. He would rather be out in the war zone."(73)

The torpedo tubes were obviously suspect, and the court's focus on them was to be expected. However, it found no direct evidence of anything amiss with the tubes, the interlocks, or their operators. The strongest supporting evidence was that the outer door of number 1 tube was open when the boat surfaced, "as it had been used throughout the morning for firing water slugs." (14, 32) Number 4 tube was also flooded and the outer door had been open two hours earlier, but the captain believed it was shut at the time of sinking. Tube 2 contained a ready war shot and number 3 was loaded with the exercise torpedo scheduled to be fired, after which it was to be reloaded with a second war shot; neither tube would have been flooded at the time. The officers and the surviving torpedomen were unanimous in declaring it unthinkable that anyone on board would have opened both doors of a torpedo tube at the same time. The court's conclusion that the sinking resulted from flooding through the tubes rests only on the following:

Finding of Fact 32. "That the torpedo tube interlocking mechanism was in good condition, operationally and materially, so far as could be determined, but that this system is not absolutely fool-proof. It can be easily disengaged manually, so that both tube doors can be opened at the same time.(131) Opinion 11. "That one or two tubes' outer doors may have been open at the time of surfacing."(133)

FACTORS SUPPORTING STRUCTURAL FAILURE

LTJG Whetstone's report of hearing a thump in the battery room was very specific. He placed the noise between the air conditioning unit and the manhole cover to no. 1 main ballast tank on the starboard side and likened it as "similar to the letting out of the vacuum out of a tin can" or "the sound of a metal drum which had expanded in the sun."(42) Two other men who also heard it and wondered what it was did not survive, but Whetstone was impressed enough to report the thump to the control room and then inspect the compartment for possible leaks. LCDR Shelby confirmed that it was relayed to him on the bridge, but the court made no further investigation of the possible source of the thump and did not mention it in its findings.

Flooding was reported in the battery room, not the torpedo room. Testimony indicated that eight or ten men were probably in

the torpedo room either on watch or eating lunch, and that some officers were probably eating in the forward battery compartment. LT Joseph G. Anthony, a naval architect, later testified that water from an open upper tube would have spouted about thirteen feet into the room and would have taken about 20 seconds to reach the door's sill. Since the torpedo room was 31 feet long, presumably someone should have been able to report a flooding tube. However, the court concluded in Opinion 22: "That the water rushed through an open tube, through the torpedo room, cascaded into the forward battery room, and resulted in the report "Forward battery flooding."(135)

Certain features of the surfacing procedure also pointed to possible structural problems. Both LCDR Shelby and LTJG Whetstone testified that the procedure used in the R-12 differed from that followed in other R-boats.(45, 123) They described the differences only generally as relating to the control of air to #1 ballast tank, opening the drains, and getting ready on the engines. The court made no effort to ascertain exactly what was done differently on other boats. It was mentioned that Shelby normally insisted that as little air as possible be used on surfacing, a reasonable measure to save precious compressed air. Riding the vents was not the peacetime practice on R-boats, but was undoubtedly done by the other boats at Key West. The court apparently felt that none of these procedures had any bearing on the sinking and did not go into them any further.

While no specific fault can be found with the general surfacing procedure, several possible problems were identified during the boat's final surfacing. Whetstone, who was standing near the air inlet to #1 main ballast tank, thought more air than normal was being used. Zeilinski, who was standing in the control room waiting to go up to the bridge, noticed that #1 tank kept losing suction and venting air to the extent that LT Starks crossed the compartment to see what was wrong. Karpal was manning the stern planes and noticed nothing unusual before going to the bridge, where he heard Starks report that suction had been lost and the captain order using the high pressure pump because the bow looked a little low. After he was in the water he thought the boat went down with a starboard list.

The most significant testimony was given by Pool, who had been standing near the air manifold. He too noted that #1 tank was

spasmodically venting and taking suction and that much more air was being used than usual. Happening to glance at the high pressure air gauge, he thought the pressure dropped from 2200 to 1400 pounds per square inch. Pool had only been on the boat a month, and the Judge Advocate questioned him sharply: "Why would an inexperienced man notice such things as the dropping of pressure on a pressure gauge, the suction and venting of ballast tanks, which usually requires a qualified submarine man to observe and analyze?"(54) Pool responded that because he was fresh from submarine school he was trying to pick up knowledge about everything that was new to him, and reiterated his testimony when re-examined later. (94)

The court dismissed the above considerations without comment, concluding in Opinion 15, "after witnessing surfacing under similar conditions in the R-4" that the air pressure drop was not considered abnormal.(134) Actually, the test was made with the R-4 alongside the dock, in no way comparable to the conditions prevailing on the R-12.(114)

The nature of the final dive indicated that the R-12's buoyancy was lower than normal. All of the survivors testified that the boat seemed to drop out from under them before nosing down and was completely submerged in a matter of seconds. Shelby said that with the boat normally riding the vents it was practically impossible to get under in 45 seconds. LT Anthony testified that with the boat in trim and riding the vents its reserve buoyancy would have been reduced from 86 tons to 60 tons, and could have been as low as 40 tons if the tanks had not been completely dry before riding the vents. The capacity of the battery room was 52 tons, but even with 60 tons of reserve buoyancy, he said that "shifting of the water ballast in partially filled tanks and compartments would, in all probability, put the bow under."(98) Asked specifically: "What volume of water entering the forward battery room would cause the bullnose to go under," he responded: "If flooding resulted from a ruptured tank top, no water would be required in the battery compartment as number one main ballast tank would be flooded."(100)

There were clearly weaknesses in the structure of #1 main ballast tank, which was of riveted construction. The tank had been pressure tested at New London, but parts were inaccessible for inspection. These included the forward bulkhead which was

obscured by the air bottle well, the area under the magazines, the entire part constituting the battery well, and part of the port tank top that was under lockers. LT Anthony was asked to explain how a riveted joint might fail under pressure. He said a lap riveted seam would probably fail by gradual spreading to "an ever-increasing rupture" and that old rivets in a weakened plate might slip out with little or no audible sound.(100)

Shelby was more concerned that when the air conditioning unit was installed, holes had been cut in the starboard tank top and outer hull for the cooling water pipe and doubler plates had been welded around the openings. He suspected that the welding might have set up some stress in the plating and questioned Anthony about this. The naval architect replied: "If the inside of the tank were subjected to negative pressure, atmospheric pressure on the other side of the plate would cause deflection against the negative pressure. Pressure in the tank would cause deflection in the opposite direction. With a poorly welded doubler plate it is quite possible that the weld would crack due to these alternate variations in stress." (101) Shelby then asked whether this could cause the plate itself to rupture, and Anthony answered that it would not, because of the increased thickness of the doubler plate. No further questions were asked and the court recessed, with the result that the possibility of a riveted joint's failure under repeated fluctuations of pressure was never explored. The court ultimately dismissed the possibility of structural failure in Opinion 20: "That, by the process of elimination, the loss of the R-12 cannot be attributed to: "... (i) Shell plating" or, among other things, "Failure of number one main ballast tank top or bulkhead." (135)

EVIDENCE THAT THE COURT MAY HAVE PREJUDGED THE CASE

In addition to its effort to discredit Pool's observation of the air pressure gauge, there are other indications that the court had preconcluded that fault lay with the torpedo tubes. Although the survivors were unanimous in favoring structural failure over flooding through a torpedo tube, the Judge Advocate seems to have gone out of his way to shake LCDR Shelby's conviction in the following exchange:

Kelly: "Having been at 90 feet, it is almost conclusive that the boat was structurally sound and that if any weakness had been present, the failure would have taken place while at this depth. Do you agree that this eliminates a structural failure?"

Shelby: "No."

Kelly: "Why not?"

Shelby: "I have no evidence to convince me that it couldn't have been a structural failure as well as it could have been a torpedo tube."

Kelly: "What type of structural failure do you believe could cause this large volume of water to enter forward?"

Shelby: "It would have to be a direct failure of either the hull or the sides of the ballast tank, and a large failure to admit the quantity of water necessary to cause the boat to go down as she did. However, I have no evidence that this occurred."

Kelly: "Any structural failure of the nature you mentioned would no doubt have taken place at 90 feet rather than on the surface. Do you agree to that?"

Shelby: "No sir, I do not agree. I would not make a definite statement either way, that it would or it wouldn't."(30-31)

Following the testimony of the naval architect, CDR W. W. Weeden, Jr., Commander Submarine Division Twelve, was called to testify. Although he stated that the R-12 had only been in the area for a month and under his command for five days, he considered that the boat's material condition was good and that "the R-12 was organized and trained under the same standardizations as other R-boats(.)" (106) The court then asked his opinion as to what caused the loss of the R-12, to which he replied "that in view of the fact that no noise was heard indicating a hull rupture, the water must have come through a torpedo tube. This would presuppose that the outer and inner door of the tube were open at the same time."(109)

On the sixth and last day of the hearings, LT William L. Fey, Jr., skipper of the R-4, was sworn in and asked by the Judge Advocate what he thought, as officer of the deck surfacing a boat under the conditions existing on the R-12, was the probable cause of her sinking. He replied: "My first impression would be a torpedo tube derangement... No other cause is conceivable to me." (119) The stated conditions given him did not included mention of the thump

reported by LTJG Whetstone. Asked by the court his opinion as to the possibility of structural failure, he responded: "I can think of no structural failure that would occur on the surface which would not already have occurred at 90 feet."(119)

The next witness was CMM Boyce Paul Mays, also from the R-4. He was asked, considering himself as chief of the watch in the control room of an R-boat under the conditions existing in the R-12, what he thought would be the cause of the boat's sinking, "no jar or shock having been felt." He replied: "I would say something went wrong in the forward battery."(119) Asked to explain what possibly could go wrong in that compartment, he cited a failure of part of the main ballast tank. Both the Judge Advocate and the court pressed him with further questions in an apparent effort to get him to concede that flooding could only have come from the torpedo tubes, but he would not agree.

None of the above three witnesses had heard any of the testimony during the inquiry, although CDR Weeden stated that he had read Shelby's report of the sinking. Despite the obvious omissions of the thump heard in the forward battery room, neither LCDR Shelby nor LTJG Whetstone raised any objection or asked further questions of any of these witnesses.

THE DELAY IN FINDING THE SURVIVORS

While this issue was peripheral to the cause of the R-12's loss, it was within the charge to the Court of Inquiry. In peacetime, the fact that the survivors were left in the water for five and a half hours would likely have received extensive criticism in the popular press, but the court disposed of it rather perfunctorily. In its final Finding of Fact it stated that a search was instituted "soon after the sinking." (132) Actually, no one had become concerned about the R-12's safety until about three hours after the boat had sunk. CDR Weeden, the division commander, testified that he was told at 1415 that the torpedo runs had been delayed and that EAGLE 56 was unable to contact the R-12. This did not particularly concern him, because radio communications in the area were often unreliable, but when the R-2 returned at about 1510 and reported that they had not seen the R-12 all afternoon, he tried unsuccessfully to reach EAGLE 56. At 1540 he telephoned the local fleet air wing and asked that a search be started. He also checked with the skipper of CORAL and learned that the R-12 had last been seen diving. At this

point he reported to Captain Edward H. Jones, Commander Task Group 23.3 (the ships attached to the Sound School) that the boat was missing, the SC-449 and PC-451 were ordered to make a surface search. At 1722 he notified ComSubLant that the R-12 was missing and probably sunk. Other ships and planes were sent out, and at about 1750 a circling plane pointed the SC-449 to a large oil slick and a lookout spotted the survivors in the water.(102-103)

LCDR J. H. Church, Jr., in Command of USS CORAL, testified that his orders were to escort a submarine back to the base except on Saturdays when the boat was staying out for torpedo exercises. He was not instructed to turn the submarine over to another escort, but once it had surfaced he was free to return to port. The ships were about a mile apart when he saw the R-12 dive, noticed nothing abnormal about it, and did not see men in the water. Assuming the submarine had made a practice dive, he continued back to the base.

Captain Jones confirmed that an escort was usually allowed to return to port early on Saturday when "(t)here is always a submarine officer on board of the surface ship conducting the purely submarine exercises which have nothing to do with Sound school."(116)

The ship in question was the EAGLE 56 and the officer conducting the practice torpedo firings was none other than LT Kelly, the Judge Advocate of the Court of Inquiry. Calling himself as a witness, he asked himself to state all he knew about the casualty. He said that there had been about an hour's delay in getting the radio operating, because of which only the R-2 was contacted immediately to make the first torpedo run. Once this had begun, he tried to contact the other boats, and when the R-12 failed to respond he moved the R-13 and R-11 up to its place. Between about 1255 and 1630 continual efforts were made to contact the R-12 without success, but Kelly felt no concern because he knew the boat was operating with a surface vessel escort that would have known of any problem. He asked the R-11 if she was able to reach the R-12 by radio, but received a negative reply and did not notify anyone else of his inability to contact the R-12, assuming that the submarine had broken down or returned to base for some other reason. (5-6) The court asked LT Kelly no further questions of its own.

In Opinion 18 the court declared that the system for accountability of submariners at Key West was satisfactory except on Satur-

days when they were "changing from sound exercises to torpedo exercises. The accountability during this period should be more positive." (134) That final sentence should have been stated as a positive recommendation, but the court saw fit to play it down. Indeed, a more stringent finding would have reflected adversely on many of the officers involved, and might even have led to charges of negligence. Captain Charles F. Erck, the president of the Court of Inquiry, was also ComSubRon Seven and thereby the direct superior of CDR Weeden, ComSubDiv Twelve. LT Kelly, the Judge Advocate, was on the SubDiv staff and had been in direct control of the torpedo firing exercises. All three were therefore interested parties rather than neutral investigators.

THE REVIEW PROCESS

Several defects in the court's conclusions were recognized in the review process. Rear Admiral Freeland A. Daubin, ComSubLantFlt, the convening authority, noted that Opinion 21 (b) was misleading in implying that flooding could have been caused by mechanical failure of the interlock, whereas "the doors would have to be opened physically by a person." He disagreed with Opinion 25 that placed responsibility for the boat's loss on a person or persons unknown, "as there is no basis for such an assumption." The sinking could only be attributed to sudden massive flooding, but "the source of the entry of the water cannot be determined except by conjecture." (SubLant SECRET attachment, 9 July 1943)

The reviewing authority, Admiral R. E. Ingersoll, CinCLantFlt, stated that "it is not believed that the possibility of structural failure can be eliminated" and "that the sinking could be attributed to any of the causes' that had been ruled out in Opinions 20(f), (j) (m), and (s) as specific possibilities of structural failure. (LantFlt SECRET ltr serial 00848 of 17 Jul 1943)

Admiral Ernst J. King, ComInChUSFlt and CNO, approved the proceedings "as modified by the comments of the convening and reviewing authorities," thereby effectively clearing the crew of responsibility for the loss of their ship but left the cause undetermined as between flooding through a torpedo tube or a rupture in the hull structure. (ComInCh SECRET ltr serial 001463 of 22 July 1943) Inspection or salvage of the wreckage was impossible at that time, other wartime problems had higher priority, and no further investigation was ever made.

CONCLUSIONS

In my opinion the case for structural failure is much stronger than was found by the Court of Inquiry. Key members of the court, possibly because of certain conflicts of interest, focused on a cause that implied error on the part of R-12 personnel and tried to divert attention from other conditions that might have reflected unfavorably on themselves. The Judge Advocate in particular seems to have acted more like a prosecuting attorney than a neutral investigator.

The R-12 was something of an orphan boat; it had not been at Key West long enough for superior officers to have become fully acquainted with its personnel or its material condition, or for its own officers to adapt completely to local procedures and customs. In concluding that flooding had occurred through a torpedo tube, the court gave greater credence to the opinions of R-4 personnel based on hypothetical assumptions than to the repeated assertions of the R-12 survivors.

None of the members of the court had expertise about possible modes of structural failure. Although a well-qualified naval architect was available at Key West, he was not asked to evaluate the complete evidence and the defendants were not knowledgeable enough to ask him the essential searching questions. In my opinion this constituted a major deficiency in the inquiry. It may be purely coincidental that two other boats of similar design and riveted construction—the O-9 on 19 June 1941 and the S-28 on 4 July 1943—sank with all hands during submerged operations, from causes that were never determined. The survivors of the R-12 provided clues that may have a bearing on all three sinkings.

I am not a naval architect, but I have an engineering background. At submarine school I made training dives on the R-9 and the similar O-4 and O-8. I served on five fleet boats and am qualified in submarines. Later I spent several years as an engineering duty officer working in shipyards on submarines and other ships. On the basis of that experience, I believe the following plausible hypothesis can be made for the loss of the R-12.

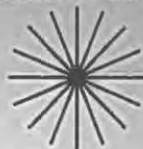
The forward ballast tank was complicated in form and had many riveted joints, several of which were in locations inaccessible for regular inspection. Since the boat's recommissioning the tank was subjected to alternate pressure and suction during 519 dives. The thump heard by LTJG Whetstone was characteristics of a joint

springing apart, which would have allowed water to enter and air to vent out of the tank. This probably started slowly but was noticeable enough that use of the high pressure pump was called for, which would have produced a greater vacuum than normal and tend to widen the gap in the joint. The wartime practice of riding the vents reduced the boat's reserve buoyancy by 30 to 50 percent and also accustomed the bridge personnel to seeing the bow ride lower in the water. When the kingstons were opened to ride the vents, the forward main ballast tank continued to fill gradually until water finally entered the forward battery compartment through either the battery well, a manhole, or some other opening. By the time it was first noticed and reported, the buoyancy had been reduced to the point that the boat started to go under immediately. The free surface effect of water in the partially filled spaces then caused the bow to tilt down rapidly and the boat to sink at a steep angle.

POSTSCRIPT

LT Starks was posthumously awarded the Navy and Marine Corps Medal, while Stanley Pool received a Letter of Commendation by the Secretary of the Navy and was recommended for a Life Saving Medal for keeping LTJG Whetstone afloat while awaiting rescue. LCDR Shelby went on to take command of SUNFISH (SS281) and conducted five war patrols in the Pacific. Whetstone was ordered to the new construction submarine PIPEFISH (SS388) and served in the Pacific. The loss of the R-12 must have preyed on his mind to the extent that he confided his concerns with shipmate Frank Ferguson, another R-boat veteran and a lifetime friend until Whetstone's death in 1970. The two apparently concluded that the suction of the high pressure pump created a heavy vacuum in the tank, producing a break that allowed the tank to refill and flood into the forward battery. Years later Ferguson sent this information to the National Archives and wrote a short article about it in *Polaris* magazine (*Polaris*/December 1999, p. 15). It was this article that stimulated my interest in the case.■

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**CDR GEORGE GRIDER'S NIGHT ORDERS
USS FLASHER (SS-249), FIFTH WAR PATROL
DECEMBER, 1944**

by Edward Monroe-Jones, Ph.D.

Dr. Edward Monroe-Jones is the Director of the Submarine Research Center (SRC), he holds a bachelor's degree from Occidental College and a doctorate from University of Southern California. He qualified as an enlisted man on STERLET (SS-392) and as an officer on SIRAGO (SS-485) and served on the SubPac staff and WAHOO (SS-565).

George Grider's heirs gave Bruce Loughbridge their grandfather's FLASHER night orders for late 1944/early 1945. The family felt it was better in a submariner's hands than in their dusty attic. The night orders were loaned to SRC for research purposes by Bruce Loughbridge, the former Chief Interior Communications Technician on DARTER (SS-576), BONEFISH (SS-582) and JAMES MONROE (SSN-622).

When USS FLASHER departed Fremantle on her fifth war patrol in mid-November, 1944 she was in company with BECUNA (SS319) and HAWKBILL (SS-366). BECUNA was commanded by CDR Hank Sturr and HAWKBILL by CDR Worth Scanland Jr. ¹ Captain Eliot H. "Swede" Bryant, ComSubRon 18, rode HAWKBILL and was the wolf pack commander.² The three boats under his command would act as a team in covering the assigned area of operations. During FLASHER's trip north from Fremantle to Darwin, the jumping off point, its captain, CDR George Grider drilled his crew. In doing so he was becoming familiar with FLASHER's routine as much as the crew of FLASHER was learning about the boat's new captain.

George Grider was an experienced submarine officer, having served with CDR Marvin Kennedy and CDR Dudley W. "Mush" Morton on WAHOO (SS-238) and S. P. Mosely in the trusty old POLLACK (SS-180).³ Grider had first met Morton at the SuBase Pearl swimming pool where he had been whipped by Morton in a

spontaneous swimming race.⁴ Morton, the famous submarine commander, had greatly influenced Grider with somewhat unorthodox fire control procedures. WAHOO's captain preferred to let his executive officer, LCDR Richard O'Kane, handle the periscope when making submerged approaches on Japanese shipping. This left Morton free to reflect on the tactical situation and observe the attack procedure without becoming involved in the detail of periscope observations.⁵ O'Kane, later to become famous in his own right as captain of TANG (SS-306), was as unique a figure as Morton. It had been he and Grider who had rigged a Graflex camera in WAHOO's wardroom to superimpose a geography textbook map of Wewak Harbor, New Guinea onto a chart and from that to create a workable chart for the exploration of the harbor. Of course, the venture into the harbor resulted in one of the Second World War's great submarine exploits.⁶ Clearly, Grider's formative years as a submarine officer were molded by the best role models.

Now, as Commanding Officer of FLASHER, he brought to the boat a vast and unique experience, yet he had the wisdom to integrate his own methods into FLASHER's existing tactical procedures without turning things upside down. The transition from FLASHER's former and very successful skipper (15 ships for 60,846 tons), CDR Reuben T. Whitaker, was comfortable for officers and men.⁷

FLASHER was a Gato class submarine and the oldest boat of the wolf pack three. It was thin skinned with a test depth of only 300 feet, but after having served on POLLACK, an even older boat with constant equipment failures, Grider had the highest regard for FLASHER. He was determined to keep up with his counterparts in whatever might come during the boat's fifth patrol. By the time the fuel tanks had been topped off in Darwin and all was ready, the new captain had confidence in his executive officer, LCDR Phil Glennon and the other members of his wardroom.

One problem plagued FLASHER. Bow buoyancy vent was unpredictable. Sometimes it worked and sometimes it didn't. In Fremantle it was thought to have been repaired by the tender, but on test dives after leaving Darwin the problem reappeared. A war patrol without a reliable bow buoyancy vent valve was not a happy prospect. Grider determined to get to the bottom of the problem and

while at sea, in dangerous waters, Auxiliaryman Bill Beaman volunteered to go inside the tank and see for himself the cause of the problem. He crawled into the superstructure, unbolted the tank's access cover, crawled inside, and while the chief on the hydraulic manifold in control, exercised the valve, Beaman adjusted the operating linkage. Satisfied that the problem had been corrected, he crawled out of the pitch-dark tank and rebolted the access cover. This claustrophobic feat in enemy patrolled waters was well recognized by Grider and such praise was well deserved.⁸

When two days later the TDC failed, Firecontrolman Joe Webb pronounced it dead on arrival. Chief Cypheard held the little follow-up motor in his hand when he told FLASHER's commanding officer that the boat had no replacement. Not giving up, Grider sent a message through ComSubRon 18 on HAWKBILL asking any boat heading for the barn to lend FLASHER the crucial follow-up motor. In four hours the boat rendezvoused with HARDHEAD (SS-365) which high-lined a replacement part. Grider exclaimed that he couldn't get that kind of service tied up alongside the tender.⁹

FLASHER had been equipped with standard radar and ECM of the time. SD was a submarine radar that used an A scope. It was useful as an air search radar, but had only one range scale up to about 20 nautical miles. Its SJ radar was its basic surface search radar with a plan position indicator and magnetron which made it directional. The SJ could present both range and bearing information.

It was later replaced by the smaller version, SS radar.¹⁰ ST radar, another late addition, could be used for obtaining range information while running at periscope depth.¹¹ FLASHER had state-of-the-art JP passive sonar. It covered 70 Hz to 12 kHz. Normally operated in the conning tower it provided approximate target bearing information as well as target speed from turn count conversion knowing the type of vessel.

FLASHER had the APR-1, this was an omni-directional electronic intelligence gathering pulse analyzer or ELINT. As the fore-runner of modern ECM equipment it covered surface vessel and aircraft frequencies and was most useful in detecting aircraft at ranges exceeding that which could be obtained by radar. The APR-5AX was the improved version.¹²

Phil Glennon, the executive officer, acted as safety officer in the conning tower's fire control party. LT Tom McCants, called "Mac" by Grider, was the torpedo data computer operator with Ensign Eddie Atkinson acting as assistant TDC operator. LT Kiko Harrison stood behind McCants at the TDC observing the solution. LT Snap Coffin was the engineer and diving officer during battle stations torpedo.¹³ LT Jim Hamlin headed the fire control plotting party which ran a geographical plot of submarine and target course and speed. The quartermaster kept the log as events unfolded. He tended the periscope's stadimeter and bearing ring when Glennon was otherwise occupied. At the opposite (forward) end of the conning tower was the battle station helmsman who kept the course and transmitted speed changes to maneuvering. Radar/sonar operator tried to take up as little space as possible in the Gato class conning tower. Of course, the captain was at the periscope during submerged approaches and at the TBT (target bearing transmitter) on the bridge when making a surface approach. Grider had elected to use the more conventional organization of the boat's fire control party, preferring to see first hand events on the surface.

By December 3, 1944 *FLASHER* had traversed the Malay Barrier, Macassar Strait and the Sulu Sea.¹⁴ It was now traveling north in the open South China Sea. The three boats operated in separate areas, but *FLASHER* had slipped out of its proper position because an overcast prevented getting a star sight. Despite this, the patrol was thus far routine. The night orders for Dec 3/4 read as follows:

3-4 Dec 1944

Underway on course 000 (T) at one-engine speed, carrying a zero float and propulsion on one engine.

At 2000, change course to 180 (T), reverse course every two hours.

Start zig zag at moonrise.

HAWKBILL is 20-30 miles to the south of us.

SJ and APR are manned.

Carry out usual morning routine.

At 0600, we will adjust course and speed to get in position 20 miles north of HAWKBILL, as advised by navigator.

Respectfully, G W Grider

Night orders initialed by B (Tom Burke), H (Jim Hamlin),
TM (Tom McCants) and FBH (Kiko Harrison).¹⁵

When dawn brought a clear sky, navigator Glennon's fix put FLASHER 15 miles west of its proper position. This may have been cause for immediate correction, except that at about the same time a message was received from HAWKBILL that a convoy was projected to pass close aboard FLASHER's present position. McCants had the deck and Grider raised the periscope. He saw the masts of the hull-down ships and gave McCants the order to come left to intercept.¹⁶ When FLASHER steadied on its new course the captain told McCants to dive the boat. At the same time the quartermaster pushed the alarm knob and men began pushing their way through the boat to their respective battle stations. McCants simply held the bridge hatch shut while the quartermaster dogged it, then slid over to the TDC. Below him in control, Coffin yelled into the conning tower that he had the dive.

When the TDC generated range was down to about 3000 yards on the lead ship a rain squall hit the area and Grider's periscope became useless. The sonar operator said that he had high speed screws. The next observation had a destroyer just where the TDC had generated it. Grider marked the bearing and Glennon repeated it from the bearing ring. With stadimeter set, Glennon told McCants the range. A small adjustment was made in the TDC, but the torpedo gyro angle was too large. Grider gave the order for a full rudder turn, but the destroyer's speed could out-pace the swing. Grider went to a full back bell on the inboard screw. With one more look through the periscope as FLASHER continued its turn, Grider decided to shoot while swinging. He gave a final bearing and shoot. Glennon repeated the order, McCants made a small correction and Atkinson was set when the red *ready* light glowed. The data was being fed into the torpedos and Grider gave the order to fire tubes one, two, three and four.¹⁷

Two loud explosions followed. Grider raised the periscope and saw the destroyer already beginning to sink. But there were two more escorts. As Grider was swinging the periscope for a quick 360 safety sweep, he caught sight of a huge tanker. His bow tube shot at the destroyer had placed his stern tubes toward the tanker. With

a quick bearing and range estimate (2500 yards) he pondered the advisability of a four torpedo spread. Glennon nodded his head and torpedoes left tubes seven and eight.¹⁸ The scope was raised and Grider saw the tanker turning. He checked fire on the remaining two torpedoes, then swung the scope to see the remaining escorts bearing down on him.

FLASHER went deep at two thirds speed and went to silent running. It had not descended far when two explosions were heard through the hull. Those in the conning tower were amazed. Both torpedoes had struck the tanker. McCants looked at his TDC solution which continued to generate. With nearly zero gyros any range error was minimized. He nodded in satisfaction. Grider said in his patrol report, "As we were going deep, heard two timed hits on tanker. Apparently, he was making more than ten knots and his maneuver slowed him down just enough to let him catch them both in the tail."¹⁹

After running deep for an hour and a half but staying in the area, FLASHER came back up to periscope depth. Clay Blair Jr. describes the scene, "He (Grider) found the tanker burning furiously and sinking aft. In addition -unbelievably- he saw another destroyer motionless on the water. Grider was uneasy. Why was this destroyer making himself a perfect target? He fired four torpedoes: three at the stopped destroyer, one at the tanker just beyond. Three torpedoes hit the destroyer."²⁰

Grider had sunk the destroyers KISHINANI and IWANAMI with the tanker HAKKO MARU. He and his crew were in good spirits. That evening he wrote his night orders and could not resist the temptation for a bit of levity:

4-5 December 1944

Underway at 2/3 speed on course 090 (T). When battery charge is completed, shift to zero float and propulsion on one engine.

At about 2300, when pit log reads 32.2 c/c to 000 (T) and instruct radio to send the wolfpack message to comwolfpack.

Reverse course at 0100 to 180 (T)

At 0200, reverse course to 000 (T)

Thereafter, reverse course every two hours on the hour.

SJ and APR are manned. Keep an alert watch as the Japs are a little piqued and may come looking for us.

When we arrive at the point at about 2300, HAWKBILL should be about 10 miles south of us.

Carry out the usual morning routine.

Respectfully, G W Grider²¹

On December 13th FLASHER received new orders from HAWKBILL. It was to approach the entrance to Manila harbor and take station at the mouth of the giant bay. The object was to intercept and sink ships entering and leaving the harbor. It arrived north of Lubang Island the next night and set up a patrol routine. It was a fruitless endeavor. Other than watching American planes bombing the mainland the surface cruise was uneventful. Grider sent HAWKBILL a tongue in cheek message that he was doing his duty. If Admiral Christie, back in Australia read it, the humor might not be well placed.

A few days later, FLASHER was ordered to leave its unproductive watch on Manila Bay and to head west to Camranh Bay on the Indo-Chinese coast, now Vietnam. Arriving there, he resumed his routine of running submerged during the day and on the surface at night while charging batteries. At one point he tried to intercept a convoy reported by DACE (SS-247), but the seas were running high and his attempt failed. His night orders for December 20/21 reflected his intentions:

December 20-21

Underway at 1/3 speed on course 180 (T) patrolling off Camranh Bay, French Indo China.

When Fisherman Island bears 300 (T) c/c to 000.

When Fisherman Island bears 235 (T) c/c to 180.

Continue this all night. Keep Fisherman Island at a distance of between 8000 and 10,000 yards when passing it abeam.

We have a 3-knot southerly current; you should stay on the northern leg much longer than the southern.

Last night there were strong indications of a 220 mgcs radar on Camranh Head. Look for it while near the southern limit of the leg.

When the charge is completed, put one engine on charge and propulsion.

SJ, APR, and sound are manned. In the event of a plane contact on SJ, submerge at a range of 6,000 yards.

PADDLE is to south of us. BECUNA is to the east.

We plan to submerge at daybreak, do not start the SD in the morning.

Keep me informed. Report any marked change in the weather.

Call me at 0600, or sooner if it appears to be getting light before then.

Respectfully G W Grider

Night orders initialed by B.(Burke) and H (Hamlin)²²

Then, at about midnight Grider decided to change his venue to the north. The night orders were modified:

0100: We are proceeding to a point off Van Fong Peninsula at a speed of 12 knots. Steer courses as directed by navigator. The general course will be about 010 (T).

When the charge is completed, put the auxiliary engine on a zero float.

Night orders initialed by TRM (McCants) and FBH (Harrison).

The waters around Van Fong Peninsula were far more traversed by Japanese north-south traffic than in and out of Manila. When late on December 20th, Grider turned FLASHER north to patrol off Hon Doi Island near Van Fong Bay, south of Cape Varella, he kept in mind the shallow water in the new area. When dawn broke, FLASHER submerged to 100 feet and went to one third speed. This minimal depth was the result of the shallow water in the patrol area. It was a dangerous hunting ground for a submarine, but the Japanese tended to hug the coast and for that reason the hunting was good.

The morning of December 21 was the boat's first day on its new station. FLASHER had dived at dawn and was running submerged

at 100 feet. LT. Burke relieved LT. Coffin in the conning tower. He ordered the diving officer to bring the boat up to periscope depth for a look-around. At 0905 he sighted a Japanese patrol boat at 177T on a northerly course. The captain was called to the conning tower and FLASHER was turned to seaward so that the patrol boat would pass between land and FLASHER. Sonar reported multiple screws to the south. GRIDER waited patiently, then spotted several large tankers. It was a juicy target, but the seas were rough and he doubted that his torpedoes could perform. He let the convoy pass, surfaced and sent a contact report.²³

Pushing FLASHER at standard on three engines he could only make about 12–13 knots through heavy seas. He stayed on the surface through the day and into the following night. Grider was like a blind man looking for a rabbit in the forest. He knew the convoy was somewhere along the coast, but he didn't know if he was ahead of it, behind it or if it had ducked into one of the many harbors to escape a suspected submarine.

Meanwhile, at about midnight the two lookouts, Radioman Fillipone and Signalman Corneau got into a heated discussion on the bridge. The port lookout watched the vague outline of the beach, miles away. Both lookouts tried to guess what the outline was. The officer of the deck got into the discussion and suggested to conn that the executive officer try to spot the outline using the periscope. Both the quartermaster and executive officer saw the shape and tried to fix it to a point of land on the chart.

As both the bridge and conning tower were pondering the problem, the captain was half awake in his bunk. Finally, he climbed the ladder into conn, but stopped to listen to the quartermaster arguing with the executive officer. Both were pointing to a spot on the chart, then peering through the periscope. It was about 0100 when Glennon admitted to the quartermaster that either Tortue Island was underway, or they had spotted the convoy.²⁴

Grider kept to seaward of the convoy and tried to get ahead of it. The escort destroyer stayed between FLASHER and his line of tankers. A few more escort vessels ranged up and down the seaward side of the ships. The tightly packed group of tankers were so close to the shore that zig zagging was impossible. Grider guessed that all the escorts had been assigned to the seaward side of the convoy since water to the west of it was too shallow for a submarine to

operate safely. Try as Grider might, he couldn't get *FLASHER* past the snoopy destroyer. He and Glennon were convinced that the Japanese captain knew that a submarine was trying to penetrate his defensive screen. Grider jockeyed *FLASHER* up and down the seaward side of the convoy, but the destroyer matched Grider's every move with a defensive one of his own. In frustration, Grider determined to plow on ahead, get in front of the convoy and drill into it no matter what the destroyer might do.

When ahead of the ships, Grider secured the engines and went ahead on the battery while remaining on the surface. He was now ahead and on the left of the convoy. The destroyer had followed *FLASHER* around the convoy's van, but veered back to the seaward side.²⁵ Land was only 12 miles to the west of *FLASHER* and the tankers were moving to pass between Cape Batangan and Kulao Rai Island. The submarine remained 30 degrees off the convoy's port bow with the lead ship about at 10,000 yards. Water depth was about 100 feet.

Jim Hamlin manned the bridge TBT and kept bearings flowing into the TDC. When the lead tanker was at 2500 yards, and McCants on TDC was tracking without difficulty, Grider fired all six forward tubes at the first two tankers; three at the first and three at the second. With full rudder the stern tubes were brought to bear on the third tanker. It was 0446 and dawn had not yet arrived as the first and second tankers exploded. Night turned into day as flames soared into the sky. Grider, on the bridge, check-fired the stern tubes. He might need the four torpedoes in tubes aft for a get-away. Time passed as McCants looked at a perfect solution with near zero torpedo gyro angle. It was now or never. Glennon in conn then fired the after tubes. In the fire control party organization, the captain was only the safety officer on the bridge and the executive officer in conn was in charge of the attack. Be it right or wrong, it was done and all held their breaths.²⁶

Even before the explosions marking the end of the third tanker, Grider and his executive officer were dealing with the destroyer. He went to flank on four engines and set course 180 degrees to slide down the west side of the three flaming, wrecked tankers. *FLASHER* would have to out-maneuver the destroyer and the other smaller escorts. It wouldn't be easy. The destroyer had radar and it was apparent to Grider that it was still shadowing *FLASHER*. As the

submarine raced south with its GM engines at 110 percent, the destroyer made a turn to parallel FLASHER on a 180 course. Grider was boxed in; the destroyer barring his way to deeper water. After covering a little over two miles, the destroyer slowed and then turned to get back to his sinking ships.

FLASHER turned east and dove after reaching submarine-safe water. It had been a long morning and all were in need of rest and a good meal. The wardroom and crews mess were both full of mutual congratulations and back slapping. At 1631 FLASHER surfaced and sent a message to CTF 71. It then headed for the barn.²⁷

It was evening and the relieving officer of the deck, Jim Hamlin reviewed the night orders on the chart table in conn prior to going onto the bridge. He took note of the captain's concern about Japanese aircraft and periscopes. They were on their way back to Fremantle, but were still in Japanese infested waters. The skipper's remark about getting home safely applied to all on board, but especially to Phil Glennon who was to be married to an Australian girl upon FLASHER's arrival in Perth.²⁸

The last line of Dec 22/23's night orders reflected Grider's concern to stay alert:

22-23 December

Underway on course 173 (T) at standard speed. Carrying a zero float on the auxiliary engine.

At about 0010, when pit log reads 55.0, c/c to 180 (T).

Zig zag until moonset.

SJ and APR are manned.

Carry out usual morning routine. Key SD continuously.

Have BN warmed up but do not use. Dive on all plane contacts at 10 miles or less.

Keep a sharp lookout for periscopes.

We want to get home.

Respectfully, G W Grider.²⁹

FLASHER's fifth war patrol lasted 48 days. During that period it sank 4 tankers and 2 destroyers for a JANAC total of 42,800 tons.³⁰

ENDNOTES

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13. Grider, op. cit., page 133.
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REUNIONS (continued)

USS HENRY CLAY SSBN-625 Sep 19-21, 2008 Charleston, SC
 POC: John Troia, Phone: 239-481-7689 E-mail Stargazer7058@aol.com

USS FULTON AS-11 Sep 22-26, 2008 Las Vegas, NV
 POC: Richard Hartman, 400 Bellevue Ave., Apt 305, Newport, RI 02840
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USS NAUTILUS SSN-571/SS-168 Sep 25-29, 2008 Groton, CT
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SUBMARINE NEWS FROM AROUND THE WORLD

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From the April 2008 Issue**SOUTH KOREA—Project Office Established for KSS-3 Submarine Program**

In mid-April 2008, AMI received information that the Republic of Korea Navy (ROKN) established the project office for the SSX Submarine Program (KSS-3). The office was established in February 2008 and will formally run the program until completion.

Currently, the KSS-3 program is in the design phase which will run through 2011. AMI estimates that both Daewoo Shipbuilding & Marine Engineering (DSME) and Hyundai Heavy Industries (HHI) are involved in the design phase. It is uncertain if the design is based on the HHI 3500-ton design that was under consideration several years ago.

South Korea utilized the German Type 209 design for its KSS-1 Submarine program that delivered nine Chang Bogo class submarines from 1993 through 2001. The German Type 214 design was selected for the KSS-2 Submarine Program that will deliver up to nine submarines through 2017.

Although South Korea is now building its second class of submarines in-country, it is possible that the ROKN could utilize a foreign design partner (possibly Australia, Sweden, Spain, France, Italy or Russia) as the SSX submarine is expected to be around 3,500 tons, much larger than the Type 209 and Type 214 designs already built by South Korean shipyards.

Assuming that the design phase is completed on schedule in 2011, a construction contract could be in place by 2013 for four units of the class. The SSX submarines will be capable of blue water operations with the larger units of the ROKN including the KDX-2 and KDX-3 destroyers and the Dokdo Ham class helicopter carriers.

With the South Koreans now experienced in submarine construction and in full development of their own weapon systems,

including anti-ship missiles and torpedoes, it appears that foreign assistance for the SSX Program will be minimal at best.

VENEZUELA—Russian Kilo Submarine Deal Expected in May

In February 2008, AMI received information that the Venezuelan Navy (Bolivarian Armada de Venezuela - ADV) was planning to sign a construction contract for three Kilo class submarines in April 2008 when Venezuelan President Hugo Chavez visited Russia. However, it now appears that the trip has been delayed until May when Chavez will visit Moscow on 07 May to attend the inauguration of Russian President-elect Dmitry Medvedev.

The deal for up to four Kilo class (636) submarines (vice three) is now scheduled to be signed during this visit. Russia's Deputy Finance Minister, Dmitry Pankin, has confirmed that a loan for US\$800M was also approved. The additional US\$200M of the estimated US\$1B deal will be provided by Venezuela.

Two of the submarines will be built at the Admiralty Shipyard in St. Petersburg and the other two in a shipyard in the Russian Far East (probably Komsomolsk-na-Amur). Komsomolsk built Kilo class submarines for export to China until production was shifted to Northern and Western Russian yards earlier this decade (2002).

The acquisition of the Russian submarines comes after Venezuela recently began to explore its options on expanding the country's Submarine Force. The two Sabalo (German Type 209) class submarines in Venezuela's inventory are undergoing modernization efforts in Porto Cabello, extending the operational life of the 30-year old submarines.

Various Did You Know?

SOUTH KOREA — In March 2008, the Republic of Korea Navy's (ROKN) second Type 214 submarine, ROKS JEONG JI began sea trials. This follows the commissioning of the first unit of the class, ROKS SON WON IL in December 2007.

From the May 2008 Issue

INDIA—Moving Forward with Air and Submarine Programs

A. Vertical Launch Missile Submarine (Project 76): In mid-May 2008, AMI received information that the Ministry of Defense had released a Request for Information (RfI) for a new class of subma-

rines (second submarine line) that includes a Vertical Launch (VL) capability for the Russian/Indian BrahMos missile. The second submarine line, known as Project 76, was expected by AMI to see an RfI to be released by the end of 2008.

Since the RfI has already been released, the MoD will probably make a decision on its design options by early 2009 before releasing a more detailed RfP in order to make a final design selection. When this program was announced in 1998, it was anticipated that the Indian Navy would use a government-to-government deal with Russia for the 10-cell Humpback Amur design.



Russian Amur 950 Submarine Design

However, by 2006 the MoD's Defense Procurement Policy (DPP) had changed its rules requiring all significant procurement programs be tendered in an open competition format; all but ending any chance of a government-to-government deal. In order to abide by the new rules, the MoD released the RfI in order to gather information on its design options. Sources indicate that the interested parties include Navantia with its S-80 design, DCNS with a Super Scorpene, ThyssenKrupp Marine with the Type 214 and the Russian Amur with Italian assistance. Of these candidates, only the Amur originally had a variant with a VL system. In order to meet the VL requirement, the other three entrants will have to modify their base submarine design in order to be selected.

AMI still believes that the 10-cell Humpback Amur will be chosen as it is the most mature design at this time.



B. Maritime Patrol Aircraft (MPA): In mid-May 2008, AMI received information that the Indian Navy (IN) has made the decision to procure eight Boeing P-8 Poseidon maritime patrol aircraft (MPA). Sources indicate that the contract will be worth around US\$2.5B with finalization coming in the next several months. The first aircraft will be delivered by 2012 with the entire force of eight units delivering by 2016.

The Poseidon bested the EADS Airbus A-391 with both of these final candidates being chosen in December 2007.

AUSTRALIA - Budget Issues Through the Next Decade

On 13 May 2008, press reporting indicated that the Australian Department of Defense was increasing the current (2008-2009) budget by AUD1.036B (US\$992M) for Australian Defense Force operations in Afghanistan, Timor-Leste, Iraq and the Solomon Islands. This influx of monies was originally viewed as stabilization funds to allow current procurement programs to continue on schedule and without slippage.

In mid-May 2008, AMI received information from sources in Australia that the defense budget increases that have been reported for 2008-2009 will have little to no impact on procurements as they are slated for *operational supplements* only.

Although the operational increase will have no effect on procurements, the Ministry of Defense (MoD) is looking to save A\$1B (US\$956M) in the procurement/Defense Materials Organization (DMO) budget this year as well as the next ten. Also, they are sliding an additional A\$1B from this year to next because of program slippages. It must be noted, this is not a savings, merely a movement of monies already allocated to certain programs.

As stated in AMI's March 2008 Hot News, these A\$1B annual savings will continue throughout the next ten years in order to reign in ballooning costs associated with equipment and manpower according to Defense Minister Joel Fitzgibbon. The majority of these savings will be seen in the civilian staff by freezing or reducing personnel numbers.

ITALY—Batch II Type 212 Submarines Approved

In late May 2008, AMI received information that the Italian House of Representatives Defense Committee formally approved

the second batch of Type 212A class submarines for the Italian Navy. A construction contract for the two submarines will probably be in place by the end of 2008.

The second two units were part of a US\$1.45B contract, which called for construction of the first two units of Batch I and options for two additional units of Batch II at a later date. The Batch I units (SALVATORE TODARO and SCIRE) were built at Fincantieri's Muggiano Shipyard and commissioned into the Italian Navy in June 2005 and May 2006, respectively. The second two units will also be built at Muggiano and will include technology upgrades in the command and control systems in order to mitigate obsolescence issues. Both of the units will be delivered to the sea service by 2016.

The costs of the two latest submarines will be spread over the 2008-2016 timeframe with the final payment occurring when the last unit is delivered.

RUSSIA—Used Kilos Possibly Available for Sale

On 14 May 2008, AMI received information that Russia may be considering the sale of used Russian Navy Kilo class submarines on the international market. AMI's sources indicated that the Russian Navy (RN) may be willing to sell decommissioned Kilo class submarines at a base price with no corresponding support package. This would enable all foreign customers the option of purchasing the submarines at a minimal price with all overhaul and modernization efforts being completed at the customer's shipyard of choice.

This may be an option for customers that are interested in procuring low cost used submarines in a very limited market, while not committing to a complete Russian solution; which is usually mired in cost overruns, delays or an unreliable through-life supply chain. A Russian hull with systems derived from non-Russian sources would also enable potential customers other finance options through the overhauling/modernization yard.

Although Russia is beginning to reemerge as a major submarine provider on the international market with new construction Kilo and Amur class submarines; there still remains a small niche market for customers that are trying to require submarines or are attempting to modernize their outdated Submarine Forces with little or no funding sources.

The main reason that Russia may be attempting to gain entry into the used submarine market is that the availability of used diesel submarines from European and other sources has largely been depleted. Available candidates as a result of the general 1990s naval worldwide draw-down have already been resold or scrapped. Although this market appears extremely small, several countries that may be interested could include Thailand, Philippines, Bangladesh, and Egypt.

UNITED KINGDOM—BMT Offers New Submarine Design

In mid-May 2008, BMT Defence Services unveiled a new submarine design, the VIDAR-36. The new, 3,600-ton ocean-going submarine is the latest design to enter the world market. The VIDAR-36 was designed by BMT's multi-disciplinary research and development team, BMT InSpira. The new design will be able to fulfill the requirements of blue water navies that operate in the open ocean environment or long distances from home. Additionally, it helps maintain the United Kingdom's critical submarine design capability.

The VIDAR-36 design can be tailored to meet various mission requirements that include extended range (AIP optional), dry or wet deck operations or the traditional anti-submarine and anti-surface warfare operations. The new submarine is 79 meters (259.1ft) in length with a range of 9,000 nautical miles (snorting) and a maximum operating depth of greater than 200 meters (656.1ft). It has six 21-inch torpedo tubes for a maximum of 18 torpedoes and missiles, or up to 36 mines.

At 3,600 tons; this submarine design will fill the gap between the smaller diesel submarines in the 500 and 2,500 ton range and the much larger nuclear-powered submarines over 5,000 tons. Currently, there are several countries that operate submarines in this category including Australia, Canada, India the Netherlands and South Korea or any regional navy that is looking to graduate to a larger, more capable submarine that can operate longer and further distances from home.

MALAYSIA—Country Highlight

The Royal Malaysian Navy (RMN) and Malaysian Maritime Enforcement Agency (MMEA) operate a capable modern fleet of

frigates, corvettes, fast attack craft (FAC), patrol vessels and amphibious and mine countermeasures vessels (MCMVs). The majority of the Malaysian fleet has been built since the 1970s.

From 1990 through 1999, the RMN has been expanding its naval capabilities as evidenced by the procurement of two Lekiu class frigates, four Laksamana (Assad) class corvettes, and one used Newport class tank landing ship (LST). These vessels were procured under two Malaysian Government budget plans known as Malaysia Plan (MP) 6 (1990-1995) and MP 7 (1996-2000). Since 2000 (under MP 8 2001-2005), the RMN has been involved in several procurement programs including two Kedah class (Next Generation Patrol Vessels) offshore patrol vessels (OPVs) of which the first two units have been commissioned (four additional units under construction) and the Scorpene submarine program, which will deliver two new-construction Scorpene submarines and one used AGOSTA 708 by 2009. In addition, the naval helicopter force was upgraded with the delivery of six Augusta Westland AS555 Fennec helicopters.

Additional program that are currently being planned by the RMN that could possibly start in the next two decades under Malaysia Plans 9 (2006-2010), 10 (2011-2015) and 11 (2016-2020) include: A continuation of the Lekiu class frigate with the acquisition of four additional units, three additional Scorpene submarines, new landing platform, docks (LPDs), a tank landing ship (LST), logistics ships, an ocean surveillance ship (AOS) and mine countermeasures vessels (MCMVs).

In regards to the Lekiu Class Frigate (Batch II & III), a construction contract for the two units of Batch II (units three and four) could be in place by the close of 2008. The two optional units under Batch III (five and six) could be funded under MP 10 (2011-2015) with a construction contract by around 2013. All six units could be commissioned into the RMN by 2018 if there are no further delays in the program.

The Kedah class OPV program continues to move forward slowly with unit three being launched from Boustead Naval Shipyard in 2007, and units four through six scheduled to begin by 2009. All six units of Batch I will probably enter service by 2010. Up to six additional units could be funded under MP 10 (2011-2015).

Both units of the Scorpene class submarine will probably enter service with the RMN by 2010. The first unit (being built in France) began construction in December 2003 and was launched in 2007. The second unit began at Navantia in Spain in late 2004 and will be launched in 2009. Up to three additional Scorpene class submarines could be ordered under this program with funding possible by 2016 (under MP 11 2016-2020) since the sea service has a requirement for up to five submarines.

The Malaysian Armed Forces (MAF) is also planning for the procurement of three LPDs to support an Army Rapid Deployment Battalion, as well as serve as a command ship. The LPD program will probably begin around 2011 under MP 10 (2011-2015).

In the longer term, the RMN has a requirement for one tank landing ship (LST) to replace the Newport class LST that was procured from the US, four MCMVs to replace the Mahamiru (Lerici) class MHCs as well as two logistics support ships (AOE) and one ocean surveillance ship (AOS).

In regards to the MMEA, which became operational in mid-2005, (formed from the Police, Customs, and Fisheries Departments) it will continue with developmental plans for various patrol vessels. MMEA requirements also call for ten medium patrol boats in the 55-60 meter range and fifteen high-speed patrol boats in the 35-40 meter range. The medium and high-speed patrol boat programs will probably also begin under MP 9 (2006-2010) and MP 10 (2011-2015).

Various Did You Know?

SOUTH AFRICA—On 22 May 2008, the South African Navy (SAN) took delivery of the third and final unit of the Type 209 submarine, the **SAS QUEEN MODJADJI 1.**■

REUNIONS (continued)

USS DIABLO SS-479 Oct 1-5, 2008 Gatlinburg, TN

Loc: Park Vista Resort

POC: Robert V. (Johnny) Johnson Phone: 1-321-255-3181(H); 1-321-254-8459(O)

E-mail: johnsonb@brevard.net

USS PICKEREL SS-524/SS-177 Oct 7-11, 2008 Branson, MO

Loc: Lodge of the Ozarks

POC: West- Bill Staab E-mail: BillStaab@aol.com Phone: 757-467-3695

East-Dick Helm E-mail: subvet66-ss524@yahoo.com

SUBMARINE COMMUNITY

USNA SUBMARINE BIRTHDAY BALL REMARKS

5 APRIL 2008

VICE ADMIRAL JOHN J. DONNELLY, USN
COMMANDER, SUBMARINE FORCES

Fellow Flag Officers, distinguished guests, fellow submariners, ladies and gentlemen, and especially members of the Brigade of Midshipmen, it's a wonderful evening and I thank you for attending the Naval Academy's Submarine Birthday Ball. Mimi and I are delighted to be back here in Annapolis to celebrate our community's 108th birthday!

We have a lot to be proud of over the history of the Submarine Force and some of that history was made by the distinguished guests who are here with us tonight..... I'll speak to that in a moment but first I'd like to commend the USNA Birthday Ball Committee for putting together a truly first rate evening.

Tonight as we celebrate our United States Submarine Force heritage, our recent accomplishments, and we look forward to our promising future, I ask that each of you keep in mind all our Submariners who are at sea around the world.

I'll make my remarks brief tonight. On the celebration of our 108 year history, I will touch on the past, the present and the future of our force. First some sea stories from the past to illustrate our great heritage:

I consider the exploits of our submarine Sailors during World War II an important chapter in our heritage. Their victory cemented forever our Submarine Force's warfighting ethos. It was a victory they purchased with their youth, their skill, their courage, and all too often with their lives.

We lost a WWII submarine legend this past year with the passing of Naval Academy graduate, recipient of four Navy Crosses and the Medal of Honor, Rear Admiral Eugene Fluckey.

He was commissioned in June 1935 and established himself as one of our greatest submarine skippers as his boat, USS BARB (SS-220), was credited with sinking 17 enemy ships during World War II.

Exemplifying what it means to be an academy graduate and a submarine officer, then-Commander Fluckey showed gallantry and courage on his 11th war patrol along the east coast of China in January of 1945.

After sinking a large enemy ammunition ship and damaging additional shipping during a running 2-hour night battle, he located a concentration of more than 30 enemy ships in the lower reaches of the secluded Nam Kwan Harbor.

Fully aware that a safe return would necessitate an hour's run at full speed through the uncharted, mined, and rock-obstructed waters, he bravely ordered, "Battle station—torpedoes!" In a daring penetration of the heavy enemy screen, and riding in only 30 feet of water, he launched BARB's last forward torpedoes at a range of only 3,000 yards. Quickly reversing course and bringing the ship's stern tubes to bear, he turned loose 4 more torpedoes into the enemy, obtaining 8 direct hits on 6 of the main targets.

Clearing the treacherous area at high speed, he brought BARB through to safety and 4 days later sank another large freighter to complete a record of heroic combat achievement.

In another of the numerous heroic actions attributed to his crew, Fluckey sent a landing party—comprised of his own Sailors—ashore to attack a coastal railway line. The Sailors were able to destroy a 16-car train using explosives loaded into a large pickle can. As it turns out, this was the sole landing by U.S. military forces on the main Japanese home islands during World War II.

His courageous leadership and innovative tactics leaving the enemy baffled as to the direction of his next attack, lead others to nickname him the "Gallopig Ghost of the China Coast".

Another one of my personal heroes, VADM Charles A. Lockwood, who commanded our Pacific Submarine Forces during WWII, reflected on the remarkable accomplishments of the submariners of that day when he said,

"They were no supermen, nor were they endowed with any supernatural qualities of heroism. They were merely top-notch American lads, well trained, well treated, well armed and provided with superb ships."

Those same qualities have been evident in submarine Sailors throughout our history.

Another chapter of our Submarine Force heritage was written during the Cold War when our Sailors continued to display exceptional professionalism and commitment to the mission. Many of these missions remain classified but are just as important to our submarine legacy.

During that time, trailing Soviet ballistic missile submarines to monitor their activities, understand their operating patterns and , if necessary, prevent their attack on the United States was imperative. A particular trailing operation—given the code name Evening Star—began in March, 1978 when USS BATFISH, led by then Commander Thomas Evans, intercepted a Yankee class SSBN in the Norwegian Sea.

BATFISH, had been sent out specifically to intercept the Soviet submarine as U.S. intelligence had been alerted to her probable departure from the Kola Peninsula by Norwegian intelligence activities and U.S. spy satellites.

The trail was maintained by BATFISH for 44 continuous days, the longest trail of a Yankee conducted to that date by a U.S. submarine. They trailed at a certain critical distance—what Evans called getting tactical control—such that they could hear the Soviet submarine but the Soviet submarine could not hear them.

During that period, the Yankee traveled almost 9,000 nautical miles, including a 19-day *alert* phase, much of it some 1,600 nautical miles from the U.S. coastline. Information regarding this patrol was not released to the public for another two decades. There are numerous other examples of cold-war era heroism and commitment to mission that remain highly classified to this day. Some of these missions were executed by the distinguished guests here with us tonight.

Many analysts believe that the Soviets' knowledge that we were tracking their ballistic missile submarines with impunity, led them to a very expensive submarine design and construction program to silence their boats. It is also believed that that effort contributed to the decline of other branches of the Soviet Union's military and the entire Soviet economy through the budget drain that effort created.

And that leads me to the present. As it was during WWII, and the Cold War, the cornerstone of our Force is our people. In fact, that has been true throughout our 108 year history. I have always been proud to be a Submariner, but as Commander Submarine

Forces, I am reminded daily of the remarkable caliber and commitment of my fellow submarine Sailors.

They are talented, highly motivated and have chosen to serve their nation on the world's finest submarines. Interacting with submariners is clearly the best part of my job!

Our submarines are in very high demand today, and it's my job to ensure the crews will be ready to perform any mission tasking while deployed forward. Day-in and day-out, our crews gather intelligence and they shape the environment to help avert and deter conflict. Yet they stand ready to engage quickly and decisively, if necessary.

Currently, our force has 70 submarines, made up of SSNs, SSBNs, and SSGNs, that play a significant role in providing forward deployed, decisive maritime power.

Today, we have 31 submarines underway with 11 SSNs and 1 SSGN on deployment and 7 SSBNs at sea providing strategic deterrence.

All together at this moment there are about almost 5000 submariners underway standing the watch for our nation.

USS HAWAII, the nation's newest Virginia-class submarine, is in the SOUTHCOM area of responsibility helping to counter the illicit trafficking of narcotics.

MONTPELIER and NORFOLK are deployed to the CENTCOM area of responsibility helping to provide the conditions for security and stability in those waters.

USS DALLAS is underway in the Mediterranean Sea after participating in NATO's "Operation Active Endeavor," and helping to detect and respond to terrorists and other transnational threats.

Our first SSGN, USS OHIO, is in the Western Pacific after participating in the bi-national exercise Key Resolve/Foal Eagle and conducting the first foreign port visit for an SSGN in Pusan, Republic of Korea.

The future of our force is bright and filled with opportunity. We are adding even more capability to the fleet as we look forward to the commissioning of USS NORTH CAROLINA next month and USS NEW HAMPSHIRE in October. These will be the fourth and fifth Virginia class submarines to join the fleet. Two ships of that class, VIRGINIA and, as I just mentioned, HAWAII, have already deployed to support Combatant Commander requirements. We are

about to double the build rate for VIRGINIA class submarines to two ships per year and later this year we plan to award the contract for construction of the next 8 ships of that class.

Additionally, we just completed bringing four guided missile submarines online with the final conversion and return to service of USS GEORGIA a little more than a week ago.

We are also beginning the research and development effort for the next generation of Sea Based Strategic Deterrent that will replace our 14 Ohio Class SSBNs when they begin to retire nineteen years from now.

To all you future submariners in the room, your future is indeed bright and exciting. I welcome you to our elite force. Everyday I see the wonderful force you are joining. Our submarines will remain in high demand and with our ongoing modernization and construction programs we will remain the most modern force in the world. To borrow the words of ADM Lockwood, you will be the next generation of top-notch American lads, well trained, well treated, well armed and provided with superb ships. You will write the next chapter of our history. Your leadership will be vital and I encourage you to do great things. This nation and these times will require yet another generation of heroes. Let your conduct define you and your generation. Prove yourself worthy and lead your people to accomplish great goals.

So, once again, Happy Birthday Submarine Force. Our 108-year history is something we can all be proud of. Today we are the finest, most capable Submarine Force the world has ever known and our future is indeed bright and exciting.

God bless the Submarine Force, our great Navy and the United States of America. Thank you for attending this celebration and have a wonderful evening.■

DOLPHIN SCHOLARSHIP FOUNDATION

Mrs. Randi Klein, Executive Director

The Dolphin Scholarship Foundation (DSF) is pleased to announce the selection of 44 outstanding high school and college students as the **2008 Dolphin Scholars**. Each Dolphin Scholar will receive an annual award of \$3,400 per year for up to four years of undergraduate study. This fall DSF will fund a total of 137 scholarships, including 93 scholarships renewed for the 2008-2009 school year, for an annual total of **\$465,800** in Dolphin Scholarships. The Foundation also awards the independent *Laura W. Bush Scholarship* for children of crewmembers of USS TEXAS (SSN 775).

Dolphin Scholarship Foundation was founded in 1960 and awarded the first Dolphin Scholarship of \$350 in 1961 to John L. Haines, Jr. The scholarship is available to children of members or former members of the U.S. Navy who served in, or in direct support of, the Submarine Force. The 2008 Dolphin Scholars were selected from 231 applicants. Final selection was based on three criteria: academic proficiency, financial need, and commitment and excellence in school and community activities.

Members of the military and civilian community comprised the Scholarship Selection Board, including active duty, spouse and education representatives and the DSF President, Mrs. Mimi Donnelly. Of the 44 Dolphin Scholars selected, 33 were high school seniors and 11 were college students, 13 male and 31 female. Twenty-two of the submarine sponsors were from the enlisted community and 22 were officers. Congratulations to the new **2008 Dolphin Scholars!**

High school seniors selected:

<u>Student</u>	<u>Sponsor</u>	<u>Home State</u>
Jaquelyn A. Anderson	CW05 James D. Anderson, USN	CA
Rebecca L. Belcher	LCDR Brian K. Belcher, USN (Ret.)	CT
Katelyn M. Binder	ETC(SS) Frederic A. Binder, USN (Ret.)	GA
Hannah M. Drake	MMCS(SS) Ashley R. Drake, USN	CT
Andrew B. Fredericks	ETI(SS) Richard W. Fredericks, USN (Disch.)	GA
Ren D. Geryak	LCDR Peter R. Geryak, USN	FL
Kathryn M. Johannes	CAPT Joseph E. Johannes, Jr., USN	VA
Kari T. Koch	YNC(SS) Jeffrey A. Koch, USN (Ret.)	ME
Joseph P. Lee	CWO3 Robert J. Lee, USN (Ret.)	VA

<u>Student</u>	<u>Sponsor</u>	<u>Home State</u>
Amelia F. Longo	MTC(SS) Gregory L. Alderman, USN (Ret.)	GA
Patrick M. Lowery	CAPT Frank J. Lowery, Jr., USN	CT
Kelly C. McColl	CDR Angus A. McColl, USN (Ret.)	CA
Katrina M. Miller	STS1(SS) Richard A. Miller, USN (Ret.)	NV
Rebecca M. Ogram	LT Donald T. Ogram, Jr., USN (Disch.)	NC
Chesney S. Oravec	LCDR Michael J. Oravec, USN (Ret.)	VA
Hannah L. Pealstrom	MMC(SS) Barry W. Pealstrom, USN (Ret.)	WA
Aaron J. Pendola	CDR John J. Pendola, USN (Ret.)	VA
Christopher M. Pietras	CAPT Christopher R. Pietras, USN	CT
Bethany L. Potter	MMCS(SS) Charles S. Potter, USN	CT
Johnna R. Rice	EMI(SS/DV) Craig M. Rice, USN (Disch.)	MI
Alyssa M. Rose	MS1(SS) Dean E. Rose, USN (Ret.)	GA
Lorah C. Slaton	MMC(SS) Phillip L. Slaton, USN (Ret.)	IL
Sara C. Smits	CDR Theodore V. Smits, USN (Ret.)	NE
Amanda K. Snyder	STSC(SS) Danny L. Snyder, USN	WA
Leilani S. Speer	CAPT Robert G. Speer, USN (Ret.)	HI
Jodie M. Spencer	TMC(SS) William E. Spencer, USN (Ret.)	IN
Ellen J. Squier	ET1(SS) William B. Squier, USN (Disch.)	PA
Amanda M. Swanson	LT Steven V. Swanson, USN (Ret.)	GA
Ariel P. Tarrell	LCDR Alvin E. Tarrell, USN (Ret.)	NE
Valerie L. Thomas	STSC(SS) Timothy M. Thomas, USN (Ret.)	VA
Nicole B. Torcolini	CDR Kevin M. Torcolini, USN (Ret.)	WA
Stephanie A. Vece	LCDR Thomas W. Vece, USN (Ret.)	VA
Jacob A. Walsh	ETCS(SS) Joseph E. Walsh, USN (Ret.)	GA

Undergraduate college students selected:

<u>Student</u>	<u>Sponsor</u>	<u>Home State</u>
Kyle D. Clinch	LCDR Kevin D. Clinch, USN (Ret.)	VA
Jodi M. Emch	MMC(SS) John S. Emch, USN (Ret.)	AZ
Kristin N. Farley	PNI Wayne L. Farley, USN (Ret.)	GA
Torria G. Goff	MMCS(SS) Joe R. Goff, USN	CT
David P. Mattern	STS1(SS/DV) James C. Mattern, Jr., USN (Disch.)	OH
Dillon C. Powers	CAPT Jeffrey T. Powers, USN	HI
Mary P. Schwanz	CAPT John J. Schwanz, USN (Ret.)	MD
Robert C. Shubert	QMC(SS) Gary F. Shubert, USN (Deceased.)	VA
Joshua M. Thompson	MM1(SS) Eric P. Thompson, USN (Ret.)	GA
Mary K. Tyler	CDR Hansford D. Tyler, III, USN (Ret.)	FL
Jessica M. Williams	CDR Gordon C. Williams, USN (Ret.)	VA

MEMORIAL SCHOLARSHIP

For many years, LCDR Robert "Ben" Benites, USN (Ret.) was the National Scholarship Liaison for U.S. Submarine Veterans of World War II, and was instrumental in bringing the SUBVETS scholarship program to DSF. A one year scholarship will be awarded in his memory for 2008-2009.

DSF will also award a one year memorial scholarship for Board Member Emeritus Vice Admiral C.E. "Ebbie" Bell, Jr., USN (Retired), who dedicated many years of service to our country, our Navy and our submarine families.

DONORS

The Foundation greatly appreciates the support of our generous donors, yet we need to continue to increase our funding in order to grow our scholarship program. DSF has created *The Parents' Circle* as part of *The Haines Society* to recognize parents of Dolphin Scholars who give back to the Foundation.

FORMER SCHOLARS

The ongoing search for former Dolphin Scholars has located over 70 of our *lost* alumni to inform them of Foundation activities and to include them in our 50th Anniversary celebration.

RACE TO THE NORTH POLE

At press time, the virtual submarine **Race to the North Pole** has 74 submarines entered, with donations totaling over \$40,000. The race will end August 3, 2008, so it's not too late to enter your favorite submarine! For more details and race progress, please visit the DSF website, www.dolphinscholarship.org.

USS NAUTILUS	SSN 571
USS FLASHER	SSN 613
USS CAVALLA	SSN 684
USS SILVERSIDES	SSN 679
USS SEADRAGON	SSN 584
USS MINNEAPOLIS-ST. PAUL	SSN 708
USS TRUMPETFISH	SSN 425
USS GROTON	SSN 694
USS BLACKFIN	SS 322
USS JEFFERSON CITY	SSN 759
USS RICHARD B. RUSSELL	SSN 687
USS SAN JUAN	SSN 751
PCU NEW MEXICO	SSN 779
USS SARGO	SSN 583
USS ASHEVILLE	SSN 758
USS PERMIT	SSN 594
USS OHIO	SSBN 726 (GOLD)
USS HENRY M JACKSON	SSBN 730
USS SKATE	SSN 578
USS PITTSBURGH	SSN 720
USS SUNFISH	SSN 649
USS VIRGINIA	SSN 774
USS BATFISH	SSN 681
USS ANNAPOLIS	SSN 760
USS ALEXANDRIA	SSN 757

USS JACKSONVILLE	SSN 699	USS CATFISH	SS 339
USS LOS ANGELES	SSN 688	USS BATON ROUGE	SSN 689
USS CHARLOTTE	SSN 766	USS GRENADIER	SS 210
USS BREMERTON	SSN 698	NEVERSAIL	UNDESIGNATED
USS AUGUSTA	SSN 710	USS NEWPORT NEWS	SSN 750
USS PLUNGER	SSN 595	USS FINBACK	SSN 670
USS JACK	SS 259	USS SALT LAKE CITY	SSN 716
USS ALEXANDER HAMILTON	SSBN 617 (BLUE)	USS CITY OF CORPUS CHRISTI	SSN 705
USS SHARK	SSN 591	USS TIRU	SS 416
USS ARCHERFISH	SSN 678	USS SCRANTON	SSN 756
USS BOSTON	SSN 703	USS DIABLO	SS 479
USS GUDGEON	SS 567	USS CHIVO	SS 341
USS GEORGIA	SSGN 729	USS CARP	SS 338
USS MICHIGAN	SSBN 727	USS HENRY CLAY	SSBN 625
USS SAM RAYBURN	SSBN 635	USS ROBERT E. LEE	SSBN 625
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USS SPRINGFIELD	SSN 761	USS SNOOK	SS 279
USS JOHN C CALHOUN	SSBN 630	USS PIPER	SS 409
WAR PIG	Representing several boats	USS CLAMAGORE	SS 343
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USS PASADENA	SSN 752	USS SEA DOG	SS 401
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ANNUAL GOLF TOURNAMENT

The 2008 Annual DSF Golf Tournament will be Friday, October 3, 2008, at Heron Ridge Golf Club, Virginia Beach, Virginia. Corporate sponsors at press time include Lockheed Martin MS2, Northrop Grumman, General Dynamics, Nuclear Fuel Services, GEICO, Dresser-Rand, L-3 Services Unidyne and Joe Buff, Inc.

Sponsorships are still available, and players may register online at www.dolphinscholarship.org.

STAFF CHANGES

The Foundation sadly bid farewell to Mrs. Tomi Roeske, DSF Scholarship Administrator for 16 years. She is *retiring* to spend more time with her family. She has accepted the volunteer position of DSF "Ambassador-at-Large" and will remain involved in championing the cause of our scholarship program for children of submarine families. Mrs. Mary Bingham is the new Scholarship Administrator. Mrs. Alison Whittington, has been relieved by Mrs.

Mary Starling as the new Administrative Assistant. Mrs. Barb Stahl, Financial Administrator, Mrs. Alison Whittington, Administrative Assistant, and Mrs. Randi Klein complete the Foundation's part-time professional staff.

FOUNDATION GOALS

Members of the Foundation Board of Directors continue to serve and lead DSF forward into the 21st Century: Maryellen Baldwin; *Chairman* RADM Charles J. Beers, Jr., USN (Ret.); *Vice Chairman* RADM Arlington Campbell, USN (Ret.); *President* Mimi Donnelly, wife of VADM J.J. Donnelly, USN, COMSUBFOR; *Secretary-Treasurer* CAPT Merrill Dorman, USN (Ret.); CAPT James Hay, USN (Ret.); CAPT Charles Spence, USNR (Ret.); ETCM(SS) John Pierson, USN (Ret.); and Mr. Vincent Thomas. Dr. Roseann Runte, President of Old Dominion University has resigned to accept another position at Carlton University, Ottawa, Canada. RADM Robert H. Blount, USN (Ret.) remains *Member Emeritus*.

Prominent American citizens and retired submarine leaders serve on the Distinguished Advisory Board for the Foundation: Robert Ballard, Ph.D.; Rebecca Burkhalter; John P. Casey; ADM Henry G. Chiles, Jr., USN (Ret.), Jr.; ADM Bruce DeMars, USN (Ret.); Martha Grenfell, DSF Founder; ADM Frank B. Kelso II, USN (Ret.); John W. O'Neill; Michael Petters; VADM J. Guy Reynolds, USN (Ret.); Eleonore Rickover; Thomas C. Schievelbein; Michael W. Toner; ADM Carl Trost, USN (Ret.); ADM James D. Watkins, USN (Ret.); and John K. Welch.

In moving closer to its goal of 140 annual scholarships of \$4,000 each, the DSF Board of Directors recently approved an increase in the annual scholarship to \$3,400 each, beginning with the academic year 2008-2009.

One of the means by which the Foundation hopes to achieve this goal is to increase the awareness of planned giving and encourage submariners to consider Dolphin Scholarship Foundation in their wills. The newest *Friends of the Foundation* to make a bequest to Dolphin Scholarship Foundation are Captain and Mrs. William Bower, USN (Ret.). We thank them for their foresight and generosity.

For more information about Dolphin Scholarship Foundation, please visit our website, www.dolphinscholarship.org. ■

NSL DONORS 2008

The growth and success the Naval Submarine League has experienced has been made possible by the support of its generous members and Corporate Benefactors. The annual appeal to the membership has usually been forwarded with the Symposium mailing. This year the League has initiated a more personal means of soliciting the membership for contributions to support League initiatives and to meet increased operating costs. The President is sending personal letters to each member requesting their participation in this annual appeal and so far it has doubled the receipts we have received in any previous year. We hope to challenge every member to participate in this opportunity to participate in a once-a-year tax-deductible program to underwrite the League activities. We will report the results quarterly in the Review. The following listing reflects contributions received by the League through the end of May.

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