

UNDERSEAWARFARE

U. S. S U B M A R I N E S... B E C A U S E S T E A L T H M A T T E R S

SUBMARINE LEADERSHIP

Empowering Our Foundation of Strength:
Our Undersea Warriors



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Vice Adm. Michael J. Connor is piped aboard the *Virginia*-class attack submarine *USS New Mexico* (SSN 779) during a change of command ceremony on Sept. 7, 2012. Connor relieved Vice Adm. John M. Richardson as Commander, Submarine Forces/Submarine Force Atlantic/Allied Submarine Command during a change of command ceremony at Naval Station Norfolk.

U.S. Navy photo by Mass Communication Specialist 1st Class Todd A. Schaffer.

UNDERSEAWARFARE

THE OFFICIAL MAGAZINE OF THE U.S. SUBMARINE FORCE

SUBMARINE LEADERSHIP

Empowering Our Foundation of Strength:
Our Undersea Warriors

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FORCE COMMANDER'S CORNER

Vice Adm. Michael J. Connor, USN
Commander, Submarine Forces



Greetings from Norfolk! There has been a lot of activity since our last edition of *UNDERSEA WARFARE* Magazine, and I am pleased to be starting this edition with my first Force Commander's Corner.

Kate and I are honored to have been given this responsibility, and we look forward to the challenges and rewards of serving as your Force Commander. As we wrap up the holiday season, I would ask that you take time to reflect on the remarkable and unique business we are in as undersea warriors. 2012 was another great year, again hallmarked by our ability to consistently provide Combatant Commanders with expertly manned submarines ready for action around the world. Every day you each serve as an integral, irreplaceable part of a complex weapon system that is a pillar of our security—accordingly, I will continue to expect much from you in terms of hard work and high standards.

As the vehicle for delivering our guidance to the fleet, Rear Adm. Caldwell, Rear Adm. Bruner, and I recently signed the new Design for Undersea Warfare—Update One and presented it to the Major and Group Commanders. It is now at the printers and will be distributed to the fleet shortly. In response to your feedback, this update builds upon the original DUSW, but now provides a sharper focus for our commanders. The central theme of Update One is the building and sustaining of high performance teams of elite individuals who are proud of their submarine heritage—warriors who know their job, who know how their job supports the team, and who naturally back each other up. Integral to this theme is our fundamental reliance on each other—our direct and unique connection between submarine crews, wide-area surveillance operators, maintenance organizations, tenders, trainers, families, and all who contribute daily to each of our successes. This is our “Foundation of Strength” and is what separates us from all other warfare communities.

In support of you, my role is to support our commanders, keep the Force properly resourced, ensure policies are in place to protect your career and family, and work with our fellow Joint and Naval Warriors to maximize our contribution to the Nation. Your role is to be the best, most effective, and most lethal undersea warrior in the world.

Based on your collective achievements, we continue to enjoy tremendous credibility with our Nation's leadership. As we move ahead, I thank ALL of you for your contributions to the greatest warfighting team under the sea. We are on a good course and as your Force Commander I intend to keep us there.

“Every day you each serve as an integral, irreplaceable part of a complex weapon system that is a pillar of our security—accordingly, I will continue to expect much from you in terms of hard work and high standards.”

Happy New Year!

A handwritten signature in black ink that reads "MJ Connor". The signature is stylized and fluid.

M J Connor



DIVISION DIRECTOR'S CORNER

Rear Adm. Barry Bruner, USN
Director, Undersea Warfare Division

This issue of *UNDERSEA WARFARE* comes on the heels of Commander, Submarine Forces' issuance of Update 1 to the Design for Undersea Warfare (DUSW). The DUSW Update is intended to keep our undersea forces aligned and to provide an update on the progress we've made so far and the work still to come in our ongoing efforts to improve the Force. In addition to identifying the undersea forces' foundation of strength—our Undersea Warriors—reiterating the DUSW Lines of Effort, and evaluating old and establishing new focus areas, Vice Adm. Connor provided his Commander's Guidance for submarine commanding officers: (1) use the boat to help achieve national objectives; (2) exercise positive leadership; (3) train, mentor, and develop your officers; and (4) build depth in your teams.

In the spirit of the DUSW, the articles featured in this issue examine our Undersea Warriors and, in particular, Submarine Leadership. Vice Adm. Konetzni (ret.) shares his thoughts on Submarine Force values and how to instill these values in today's leaders. Lt. Josh Weiss's article on boldness and initiative takes a look at the traits that characterized our operations during World War II and asks how we might reemphasize those traits to ensure undersea dominance into the future. Lt. Rob Szeligowski and Capt. (sel.) Anthony Carullo suggest that we may not need to look as far away as decades-old history to find Submariners exhibiting that boldness and initiative. A short Q&A with Vice Adm. Connor, as well as his remarks to future Submariners at the U.S. Naval Academy's Submarine Select Community Dinner, also appears in this issue.

A particular aspect of submarine leadership that I'd like to discuss is accountability. As Adm. Rickover said, "Responsibility is a unique concept. You may share it with others, but your portion is not diminished. You may delegate it, but it is still with you. If responsibility is rightfully yours, no evasion, or ignorance, or passing the blame can shift the burden to someone else. Unless you can point your finger at the man who is responsible when something goes wrong, then you have never had anyone really responsible." But this responsibility or accountability is not limited to the world of nuclear power; it extends to every area of our business, from the engineering plant to the Control Room, from submerged opera-

tions in the depths of the ocean to the simplest in port maintenance job. The harsh truth is that, as Submariners and leaders, we cannot escape our fundamental accountability for what happens to our equipment, our people, and our ships—and that is something we can never allow ourselves to forget, even when our backs are against the wall. This basic virtue is one of the strengths that make us the superb Force that we are.

"Responsibility is a unique concept. You may share it with others, but your portion is not diminished. You may delegate it, but it is still with you. If responsibility is rightfully yours, no evasion, or ignorance, or passing the blame can shift the burden to someone else."

A sobering reminder of the harsh and unforgiving environment in which we operate—and the continued need for brave and technically competent leaders—is the upcoming 50th anniversary of the loss of USS *Thresher* (SSN 593) with all hands. On 10 April 1963, *Thresher* suffered a fatal flooding casualty from which she was unable to recover, leading to the loss of the ship and the deaths of 129 men. The sacrifice of those men led our Force to greater accountability in the development of the SUBSAFE program, which implemented strict procedures for quality assurance. The SUBSAFE program is the product of critical self-assessment and led to real, dramatic improvements in the safety of our Submariners. We honor the memory of the brave men who gave their lives aboard *Thresher*.

Finally, let me offer congratulations to Adm. John Richardson on his promotion and assumption of duties as Director, Naval Nuclear Propulsion. Adm. Richardson is one of the finest officers and submariners of our generation. He served superbly as Commander, Submarine Forces and his great work will no doubt be continued by his relief, Vice Adm. Mike Connor. Congratulations to both admirals and best wishes for their new challenges.

Finally, let me offer congratulations to Adm. John Richardson on his promotion and assumption of duties as Director, Naval Nuclear Propulsion. Adm. Richardson is one of the finest officers and submariners of our generation. He served superbly as Commander, Submarine Forces and his great work will no doubt be continued by his relief, Vice Adm. Mike Connor. Congratulations to both admirals and best wishes for their new challenges.

Rear Adm. Barry Bruner

In the photo above: Mr. Brett Faneuf, CEO of Submergence Group (left); Lt. Cmdr. Kyle Lacey (middle); and Rear Adm. Bruner (right), with a scale model of the Mobile Anti-Submarine Training Target (MASST), an autonomous midget submarine simulator used to train our teams in antisubmarine warfare produced by Submergence Group.

UNDERSEAWARFARE

The Official Magazine of the U.S. Submarine Force

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UNDERSEA WARFARE is the professional magazine of the undersea warfare community. Its purpose is to educate its readers on undersea warfare missions and programs, with a particular focus on U.S. submarines. This journal will also draw upon the Submarine Force's rich historical legacy to instill a sense of pride and professionalism among community members and to enhance reader awareness of the increasing relevance of undersea warfare for our nation's defense.

The opinions and assertions herein are the personal views of the authors and do not necessarily reflect the official views of the U.S. Government, the Department of Defense, or the Department of the Navy.

Contributions and Feedback Welcome

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CHINFO Merit Award Winner



Silver Inkwell Award Winner

LETTERS TO THE EDITOR

In keeping with *UNDERSEA WARFARE* Magazine's charter as the Official Magazine of the U.S. Submarine Force, we welcome letters to the editor, questions relating to articles that have appeared in previous issues, and insights and "lessons learned" from the fleet.

UNDERSEA WARFARE Magazine reserves the right to edit submissions for length, clarity, and accuracy. All submissions become the property of *UNDERSEA WARFARE* Magazine and may be published in all media.

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FROM THE EDITOR

Stay connected, stay informed, and keep learning.

If you don't already follow us on Facebook and Twitter, now is the time to start!

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SAILORS FIRST



Sailors from USS *Oklahoma City* (SSN 723) and USS *Frank Cable* (AS 40) remove a Mark 48 ADCAP torpedo from the *Los Angeles*-class attack submarine *Oklahoma City*. *Frank Cable* conducts maintenance and support of submarines deployed in the U.S. 7th Fleet area of responsibility.

Photo by Mass Communications Specialist 1st Class Ricardo Danan

Question and Answer

Vice Admiral Connor

Commander, Submarine Forces



Photo by Lt. Brian Wierzbicki

Vice Adm. Connor is a graduate of Bowdoin College and has served in a variety of billets at sea and ashore. He previously commanded USS *Seawolf* (SSN 21) from 1997 to 2000, Submarine Squadron Eight from March 2003 to July 2004, and Submarine Group Seven/Task Force 54/74 from June 2008 to April 2010. Vice Adm. Connor most recently served as Assistant Deputy Chief of Naval Operations for Warfare Systems (N9B) on the OPNAV staff.

Q: What is your vision for the Submarine Force going forward? What are your priorities?

A: Our vision—and I say “our” because it’s the joint vision of all the Submarine Force leaders—will remain to capitalize on our unique capabilities to access denied areas, enable follow-on joint force access, and continue to fight on the leading edge. Our number one priority and our foundation for success in all other areas is you—our Submariners. Every man and woman who fights, supports, and repairs our ships, is a member of an elite, high-performance team integral and fundamental to our undersea success. Developing your skills and providing you with the tools you need to

succeed is our responsibility and is essential to sustain ongoing missions while developing future capabilities.

Q: What is the greatest challenge facing the Submarine Force in the next few years? Over the long term?

A: Our biggest challenge will be to provide the amount of forward submarine presence and surge capacity our national leaders demand with an aging fleet, while maintaining a healthy balance between maintenance training and home tempo necessary for sustained excellence. So, I guess I would say it’s all about pace and balance. While we are known for our ability to quickly respond to

areas others cannot, maintaining this ability over decades more closely represents a marathon than a sprint.

Q: What role do you envision for the undersea forces in 2025?

A: We will continue to dominate the undersea domain. Stealth, agility, mobility, and war-winning capability—that is what we have that *no* other force can bring to a battle. It is one area—maybe the *only* area—where our Nation sustains a clear advantage against all competitors, and that will not change—but there are some who are working diligently to close the gap. However, in the future, we will leverage the capacity of submarines by using unmanned vehicles and systems where appropriate. We will have many undersea warriors who are serving somewhere other than on a submarine. We will continue to expect a lot of our people—maybe even more going forward than in

Photo above: Vice Adm. Connor addresses officers and chief petty officers at Naval Submarine Base Kings Bay, Ga. on their role in U.S. strategic deterrence.

the past. We will continue to diversify our mission sets—and despite our best attempts to plan and predict, we know that the future is unpredictable.

Q: Can you give us a “progress report” on where you think the Submarine Force is today?

A: The Submarine Force enjoys tremendous credibility with our Nation’s Leadership. This is not by accident; this is based on our ability to consistently provide combatant commanders with expertly manned submarines ready for action around the world. However, the range of challenges we face—in peace and in war—is evolving rapidly. In this environment, if you are not getting better, you are getting worse. We need to adapt to new payloads so that we can do more with each submarine in the future than we do today.

Q: The tenth *Virginia*-class SSN will be delivered this year, and many of the *Virginia*’s have already completed multiple operational deployments. How would you characterize their performance in the fleet so far?

A: The *Virginia*-class Submarines are the best attack submarines ever built. We are at a steady production rate of two per year, a production rate that will slow but not stop the decline in the size of the Submarine Force. We need to keep that production rate at two per year so we can replace the *Los Angeles*-class Submarines that were commissioned in the 80s. Our *Virginia*-class program has been the most successful acquisition program in the Department of Defense and the *Virginia*-class is the platform that underpins the second and third major deliverables of the Submarine Force—covert surveillance and undeniable wartime access.

Q: The SSBN force was recently awarded a Meritorious Unit Commendation to recognize their excellence in strategic deterrence. In the context of the New START Treaty and ongoing discussions about the Nation’s nuclear posture, what role do you see SSBNs playing in the future?

A: For more than 50 years, the U.S. Navy’s ballistic-missile submarines (SSBNs) have been patrolling the world’s oceans to provide an assured second-strike capability. Since the commissioning of USS *Ohio* (SSBN

726) in 1981, *Ohio*-class SSBNs capable of launching the Trident missile have provided a credible deterrent for any enemies that would seek to use force against the United States, and assurance to allies who depend on the United States for deterrence. The inherent stealth, unparalleled firepower, and nearly limitless endurance of the SSBN provide our Nation with a unique capability. We have established the right requirements in the areas of size, stealth, payload volume, and self-defense capability for a ship that has to meet our platform attributes until about 2080. We need the *Ohio* replacement SSBN to continue our most critical mission—detering war between major powers.

Q: The first ever submarine-qualified female line officers recently received their dolphins. Can you tell us a little bit about how the progress of the integration of women in submarines has gone?

A: Our people are the most unique and indispensable resource to our national security. The integration of women aboard submarines happened smoothly, as we expected. Our submarine teams are now integrated, and these men and women are part of the legacy that came before us: The brave heroes who always took the fight to the enemy and who have shaped who we are today.

Q: What do you think has best prepared you for your current responsibilities?

A: I would say it was the support of the Sailors and my family. People outside the Submarine Force think we are all about technology. Actually, we are all about people—who do incredible things with technology. I benefited directly from the very personal type of support that you get in the Submarine Force from petty officers, chiefs, and officers during my five sea tours. They were the ones who taught me my profession, watched me learn from my mistakes, and helped me improve. My wife, Kate, and our three children allowed me to maintain balance during challenging times. They adapted to the many challenges of Navy life to make our life as a family very rewarding.

Q: What personal advice would you offer to submarine leaders that you wish you had known earlier in your career?

A: We should never underestimate the positive impact we can have on our Sailors through our interest and attention. We are a small enough Force that we can—and should—know our Sailors well enough to help them achieve success in their careers and their lives.



Vice Adm. Connor salutes as he passes through side boys upon arrival to Commander, U.S. Naval Forces Europe-Africa/Commander, U.S. 6th Fleet headquarters. He was in Naples to attend a NATO briefing and meet with senior leadership. .

Photo by Mass Communication Specialist 1st Class Christopher B. Stoltz



Photo by Gin Kai

Vice Adm. Connor offers words of inspiration to the class of 2013 at the U.S. Naval Academy's Submarine Select Community Dinner in Annapolis, Md.

Vice Adm. Connor Welcomes 2013 U.S. Naval Academy Submariners

Few activities at the U.S. Naval Academy are awaited with more anticipation than the annual Service Assignment process. Service Assignment is the program by which members of the senior class of midshipmen apply for and receive assignments to serve specific officer communities in the Navy and Marine Corps; thereby establishing initial relationships with their respective professional careers. The Service Assignment program includes a series of community familiarization briefings that supplement four years of professional education and training, experienced both at the Naval Academy and with active Navy and Marine Corps units during Summer Training. For the Class of 2013, the formal process concluded on November 28, 2012 with the official announcement of service assignments for 1,050 seniors—132 of whom were selected to serve in the Submarine Force. On the evening of January 22, the Submarine Select Community Dinner was held in the Bo Coppedge Room of the Naval Academy's Alumni Hall to welcome the future Submariners to the community. In addition to the selectees, attendees included 25 active and retired flag officers as honored guests. The evening's featured speaker was Vice Adm. Michael Connor, Commander, Submarine Forces, who offered the remarks reprinted at right.

Submariners—and of course the reason we're all here tonight, Submariners from the class of 2013!

I want to tell you how proud I am of each of you. You appear to be the most talented group of Submarine Selectees ever. What I'm being told about you is remarkable. I want to thank the submarine officers who serve here, especially Commandant Bob Clark, for attracting such talent to the Force.

Our Nation invests a tremendous amount of resources in this institution for the important mission of educating you. It should be obvious why we do this.

As noted British soldier and scholar Sir William Butler once said, "The nation that insists on drawing a broad line of demarcation between the fighter and the thinker is liable to find its fighting done by fools and its thinking done by cowards."

The Naval Academy has provided you with an exceptional intellectual foundation. Following graduation, you will receive the training that completes what you've learned here on your path to becoming capable mariners, engineers, and fighters. Then, you all will be the fighters *and* thinkers that the Submarine Force, and the Nation, truly need.

When you consider the world events today, and those that will come in the future, you can see just how important it is that our best and brightest choose military service as a profession—and Submarining in particular.

We are well into an era characterized by more instability and challenges, and increasing worldwide demands—a widely dispersed terrorist threat in some areas and rising powers in other areas who seek to intimidate their neigh-

bors—many of whom are our allies. Now, more than ever, we need determined, courageous, and thoughtful men and women who put the Nation's interest above self-interest.

The contribution you will make to the defense of your country as a Submariner is immense. It ranges from finding, fixing, and finishing terrorists in Africa to providing the bedrock of the Nation's strategic nuclear defense—the primary means of preventing large scale war between major powers. The Submarine Force is usually on station and ready when the crisis breaks. That provides our national leadership the widest possible decision space—from a completely invisible response, to a peaceful deterrent presence, to a decisive combat force.

As of now, you are a member of this elite Force. With continued hard work and determination, you will become a contributor to its future success.

So now that you are in the family, so to speak, we probably ought to have a talk about your ancestors. It all started in 1900 when we acquired the technology and learned how to operate undersea—by trial and the occasional fatal error. Early Submariners learned that the ocean is always trying to kill you. It tries harder as you go deeper, and the ocean never rests. These facts remain true to this day, and that is why we need you to be technically competent.

But our modern ethos grew out of World War II. That ethos is that we are the ones that surge forward, with no outside support and take the fight to the enemy in places and in ways that others cannot. We learned that mission success, not to mention your life, hinged on understanding your equipment—sometimes better than the people who designed it.

We learned that those who studied and adapted the best to the changing face of war prevailed. Those who could not, or would not adapt, were moved aside.

We often think of World War II submarine success in terms of the tactical success of fearless skippers like Dick O'Kane and Gene Fluckey—who took the fight to Japanese home waters when no other forces could get there. They were incredible heroes. But we should also consider the strategic success produced by another Submariner, Chester Nimitz. As he led the Pacific Fleet, he operated in an environment characterized by little guidance from above and scant intelligence. He studied the facts that he had, knew when it was time to take a calculated risk, gave good guidance to his subordinates, and trusted them to do the right thing. While many questioned his judgment and predicted failure, he had an inner confidence. Probably because the environment I just described is the environment every submarine skipper lives in.

His leadership of course led to the success in the battles of the Coral Sea and Midway. These battles turned the tide of war and enabled all that followed—and even gave some of our fellow warfare communities some moments to be proud of.

But it didn't stop with WWII.

During the Cold War, ballistic-missile submarines, and the survivability that they bring to the strategic nuclear triad, fundamentally changed the calculus of nuclear deterrence, and stabilized superpower relationships.

Think for a moment about the people who put the strategic triad together. They were people like Gen. Curtis LeMay and Adm. Arleigh Burke. People like Presidents Truman, Eisenhower, and Kennedy. What did these people have in common? Well, they all fought in at least one, and in some cases, two World Wars.

They knew what massive casualties, military and civilian, looked like, smelled like, and felt like. They were great warriors—who hated war. And they set about the task of making major power war a choice that no one would ever make again. They have been successful—for 67 years and counting. While the SSBN force ensured that we had confidence in our triad, our SSN force ensured that Russia could

never have similar confidence in theirs.

In the 1980s, we added the land attack cruise missile to our quiver. There were howls of protest from some senior submariners who thought we lost our way. Others—like Adm. Trost, who is with us this evening—saw the future. Submarines with missiles contributed heavily in Operations Desert Storm, Allied Force, Enduring Freedom, Iraqi Freedom, Odyssey Dawn, and many more that you won't hear about publically.

As Submariners, you are destined to be part of this elite group. The good news is you are well prepared. You have learned how to think, and that will serve you well as you continue the submarine path.

I have tremendous respect for the accomplishments of all of you. You are looking at a guy who kept the Naval Academy handbook on his desk as he did his homework at night all through high school. The greatest disappointment of my high school experience was that I failed to gain acceptance here . . . and had to find another way to succeed. So *all* of you are ahead of where I was at your age.

Then I see examples such as Midshipmen Galvin and McVay who are not only maintaining 4.0 CQPRs in tough fields, but are also leaders in several sports teams and professional associations.

Or Midshipman Hanlon, who is currently first for the Class of 2013 in both Overall Order of Merit and Academic Order of Merit.

And so many more of you like Midshipmen Wetzel and Penichet who are so very close to a 4.0 CQPR while also doing so much outside of academics with football, crew, sailing, professional associations, and everything else!

As I look around this hall, I see the next generation of men and women who will continue the legacy of excellence, steadfast courage, and innovation that are the hallmarks of the Nation's Undersea Warriors.

Let me talk for a minute about another incredibly talented group of people—the *enlisted* Submariners who will work with you. They will put their lives in your hands and you will put your lives in their hands. They are not very different from you.

The biggest difference—I think—is that they were often not lucky enough to have had the parents, teachers, coaches, and other mentors that helped you prepare and gain acceptance to such an amazing institution as the Naval Academy.

But they too, are smart and talented. For many of them, the journey that they made to get from where they started in life to where they are today is every bit as remarkable as the journey you made to get where you are today. Make sure you respect that, and respect them, because another part of our submarine ethos is that we need, we know, and we look out for *every* person on the ship.

I look forward to seeing each and every one of you in the fleet. It is truly an honor to be among you on this special evening.



Vice Adm. Connor speaks with Midshipmen Hussey (left) and Kotlikoff (right) of the class of 2013 at the Submarine Select Community Dinner.



Photo by Photographer's Mate 2nd Class Marlowe P. Dix.

DEVELOPING LEADERS TO SUPPORT THE DESIGN FOR UNDERSEA WARFARE

The Design for Undersea Warfare provides a clear vision of where we are, what we are, and where we want to be tomorrow as a Submarine Force. However, the Design also points out that its own success will depend on leadership, creativity, innovation, and a heightened sense of authority, responsibility, and accountability on the part of every submarine Sailor.

During my active duty service, I was fortunate to see many examples of the values and attitudes that energize individuals and groups and enable them to overcome difficult obstacles in demanding, hazardous endeavors. I believe our young submariners need to absorb these values and attitudes so they can satisfy their desire for achievement, develop a sense of belonging, think well of themselves and their shipmates, and feel in control of their own destiny. I believe the Submarine Force as a whole must embody these values if it is to live up to the standards set by the Design for Undersea Warfare.

What are these values, and how do we instill them in tomorrow's leaders?

Self-Motivation

First, we need to take advantage of the fact that almost all of our Sailors are self-propelled. Most people are self-motivated, and self-motivated people perform best when they focus on the prospect of success, when they think in terms like “I can” and “I will” rather than “I can't” and “I won't.” A successful organization encourages its members to anticipate the satisfaction and rewards of achievement, not dwell on the penalties of failure. An organization that stresses what will happen if it doesn't succeed creates a climate of fear, which is more likely to lead to failure than success. A success-oriented organization minimizes the role of fear.

Fear of failure diminishes the integrity of the team. It encourages subordinates to filter out important but unfavorable information from reports as they make their way up the chain of command. It discourages superiors from being open with subordinates. It breeds mistrust on all sides—and mistrust is particularly harmful in the Submarine Force, where we must have complete confidence in our shipmates.

Because fear breeds distrust, it also produces the wrong kind of leader at all levels. Instead of encouraging Sailors to rely on shipmates and achieve success together, it drives them to think first of themselves, of how to realize their personal and professional ambitions

regardless of how well others do. Leaders come to view subordinates as disposable conduits for their own success. They rely on coercion or manipulation, which can achieve the immediate results they are after, but only at the cost of demoralizing their subordinates over the long haul.

In contrast, positive motivation encourages honesty, productivity, and a feeling of teamwork. Positive leaders inspire subordinates by demonstrating consistent devotion to the common cause. They encourage everyone to capitalize on their strengths to maximize the effectiveness of the entire organization. This produces good results much more consistently than a calculated “carrot and stick” approach.

Self-Control

Of course, positive motivation only works if shipmates have confidence in whoever is doing the leading in a given situation. The key to inspiring confidence is self-control.

First, leaders need the self-control to master their profession completely so they can make sound decisions. “Management techniques” can’t substitute for technical understanding—certainly not in an organization as technically complex as the Submarine Force. A mechanic can’t be responsible for fixing a car engine unless he understands it thoroughly. A foreman can’t be responsible for leading a team of mechanics unless he understands what they do and can tell how well they do it. Everyone involved in making decisions in acquisition, design, operations, maintenance, and training has to be committed to the technical aspects of the job and determined to see that careful attention is paid to the technical details.

Second, leaders need the self-control to make the decisions that are necessary, whatever the circumstances, and to accept responsibility, whatever the outcome. Few things erode an organization’s confidence faster than avoiding responsibility. Every Submariner needs to be ready to make decisions and take responsibility for those decisions, because any Submariner may be called on to take the lead in some situation. Personal responsibility must permeate the Submarine Force.

Self-Confidence

Self-motivation and self-control may be essential for success, but often as not, the key to achieving it is self-confidence—the expectation of individuals and of groups

that they are going to succeed. Winning obviously breeds optimism, but optimism breeds winners. When you expect the best, you tend to get it. When you expect the worst, you often get the worst instead.

Negative thinking makes us passive when things are going well and prevents us from seeing helpful options when things go awry. Positive thinking expands our horizons by embracing each experience as an opportunity to learn and improve. We need to cultivate Submariners’ ability to see the positive aspects of any situation, because that is the only way we can be sure to capitalize on every opportunity. Optimistic leaders help turn failure into success. I would much rather lead a group that thinks it can do more than it’s actually capable of than to lead one that doesn’t think it can do everything it can.

Self-Image

Self-confidence obviously depends on having a positive image of the organization we belong to, be it a department, a boat, or the entire Submarine Force. Our achievements in the present and the achievements of those who came before us give us a lot to be proud of. But what about the future? How do we build a positive image of what the Submarine Force will become as we grapple with changes and uncertainty in a new century?

Maintaining a positive self-image will require an ability to imagine ourselves taking on new roles as an organization. In other words, we need a compelling strategic vision if we are going to grow and advance. And so we must enhance our ability to develop and communicate a clear and compelling picture

Most people are self-motivated, and self-motivated people perform best when they focus on the prospect of success, when they think in terms like “I can” and “I will.”



Vice Adm. Konetzni (ret.) presenting awards—Positive motivation encourages honesty, productivity, and a feeling of teamwork.

Photo courtesy of Vice Adm. Konetzni



Vice Adm. Konetzni (ret.) with the wardroom of JDS *Oyashio* (SS 590): “To successfully implement even the best strategy, we need to encourage open and honest discussion, decide on a grounded approach, and then drive collective implementation.” Photo courtesy of Vice Adm. Konetzni

of where undersea warfare is headed. The Design for Undersea Warfare is a big step in that direction, but it is only the first step.

It is essential to outline lofty expectations for the future, but even well-thought-out strategies based on important insights about the long-term future can fail to produce meaningful or desired results if they lack realism and detail in the near term. To successfully implement even the best strategy, we need to encourage open and honest discussion, decide on a grounded approach, and then drive collective implementation. Our young leaders will embrace such an approach, because it gives them a role and a stake in the process.

And we have to remember that even the best strategy can't tell us the future. As time passes, we're undoubtedly going to encounter things that we simply can't foresee at present, so we need to keep our eyes open, and that applies especially to the younger members of the Force. We need to imbue our young people with the ability to imagine themselves and their organizations in new roles, the ability to develop compelling visions of the future beyond what we currently see. If we can do that, we will create leaders who can communicate well and help create positive change. These people will make the Design better than it is today!

Self-Discipline

If self-control is about mastering our profession and taking responsibility, self-discipline is about doing our jobs correctly,

both as individuals and in groups. It is making sure we undertake every task we are given in a way that ensures success. That means learning the fundamental principles that have ensured success in the past and following these principles until they become second nature. As leaders, we take responsibility not only for performing our own tasks properly, but also for helping our shipmates observe the correct procedures, and we must be willing to accept their help in return. Success requires teamwork, and teamwork requires constructive give and take among peers and also between subordinates and superiors. Everyone is responsible for the group's success.

Where do we find the fundamental principles of our work as Submariners? The principles Adm. Hyman Rickover followed in building the nuclear Submarine Force have kept our Force safe and successful for half a century. Rickover didn't invent these principles, which have been around for a long time, but he had a way of bringing them to life and instilling them in the people he led.

The following list from the U.S. Naval Nuclear Propulsion Program contains the basic principles that all of our young leaders need to absorb early in their careers to ensure that the Force remains safe and effective as we evolve and grow:

- Each individual ensures integrity of own work activities and validation of results
- Technical work reflects appropriate design conservatism and considers pos-

sibility and potential impacts of errors

- Technical work reflects long-term concern for well-being of personnel, public and environment
- Work is controlled based on importance and type
- Personnel shall be technically competent and trained
- Each individual shall look for ways to improve work activities and products or services
- Each individual shall act to prevent recurrence of problems and ensure repeat of successes
- Each individual shall ensure technical bases of current work are understood
- Changes to requirements, activities, products, or service shall be based on understanding reasons behind them and technical bases for changes
- Each individual is responsible for the quality and timeliness of work under their cognizance
- Products and services shall fully satisfy the intended uses and requirements of specifications, standards, and practices
- Documentation shall be complete, retrievable and repeatable; validated and sufficiently detailed to be understood independently by a knowledgeable individual
- Each organization shall control and manage interfaces to ensure that applicable requirements are met and communication and long-term planning are integrated within the program
- Free and open exchange of valid technical positions shall be encouraged. Formal correspondence shall include clear, complete, and objective discussion of relevant facts and valid technical positions on key issues, including those that may be viewed as dissenting, and why the selected recommendation is the best option

That last principle—about dissenting views—is particularly important. The willingness and the patience to encourage minority opinions and never to penalize honest and thoughtful dissent is an integral part of the self-control and self-discipline we expect in a leader.

In short, self-discipline builds a command culture that:

- Encourages dissenting opinions
- Allows questioning attitudes to identify problems

- Pushes personnel to work on small problems in order to prevent big ones
- Insists on finding the technically correct solution first, before assessing the cost and schedule impact

Self-Projection

As we move forward, we will require excellence in communication across the Force. Leaders at every level must appreciate how important it is to spend time with those they lead. They will need to hone their listening skills, which will increasingly be put to the test in an era of rapid change. They will have to develop a strong understanding of body language, which is one of the most important ways of listening and communicating. It's important that the young leaders now joining the Submarine Force learn the skills of listening and communicating.

It is equally important that more senior leaders continue to maintain and improve their proficiency as communicators. We have to listen to our young people and learn from them if we are to instill them with the faith and confidence in themselves that will empower them to meet our high standards and expectations. We must select and train the right people for the job, give them broad, clear guidance, and let them get on with their business. Only those who are inspired to believe in themselves will achieve great things.

As our young leaders mature and grow to believe in themselves, their ability to project themselves and communicate goals to all stakeholders will become an important aspect of their overall professional success. Training in communication skills will become an increasingly important part of a Submariner's education. Giving leaders the confidence to engage in technical discussions without fear; teaching them what questions to ask and whether answers make sense, will give them a firm foundation for discussions of a broader nature later on—discussions with other Navy communities, with other services, and with leaders in the executive and legislative branches of government. In the end, it will also equip them to educate the American public about the Submarine Force and its vital missions.

The Management-Leadership Continuum

What makes a good leader? Background, personality, training, and environment all play a part. Nothing, however, is more impor-

tant than a good command culture. Those in authority now instill the traits of leadership in those who will come after. How well we lead now determines how well young people lead once they assume our responsibilities.

What is good leadership? The answer lies in the traits that have made the officers and enlisted personnel of the Submarine Force respected around the world. A document from the Institute of Nuclear Power Operations entitled *Leadership Traits of the Exceptional Nuclear Leader* lists these attributes:

As we move forward, we will require excellence in communication across the Force. Leaders at every level must appreciate how important it is to spend time with those they lead.

- Tenacious advocate for nuclear safety
- Establishes and maintains personal integrity
- Jointly creates a clear vision of possibility
- Uncompromisingly high standards
- Willing to do the work of critical thinking
- Accepts responsibility—does not pass the buck
- Upbeat, maintains a positive attitude—an energy supplier
- Pattern of consistently good judgment, not flawless, but well above average
- Willingly addresses difficult personnel issues

Why is good leadership so essential to the Submarine Force? Nothing is without risk. Society at large accepts that a given number of fatal automobile accidents and even a few major airline crashes will happen every year. But the Submarine Force is rightfully held to a higher standard when it comes to safety. Nuclear power has enabled us to play a central role in an incredible variety of military operations around the world, but one significant nuclear incident could eradicate much of the good we have been able to do over more than half a century.

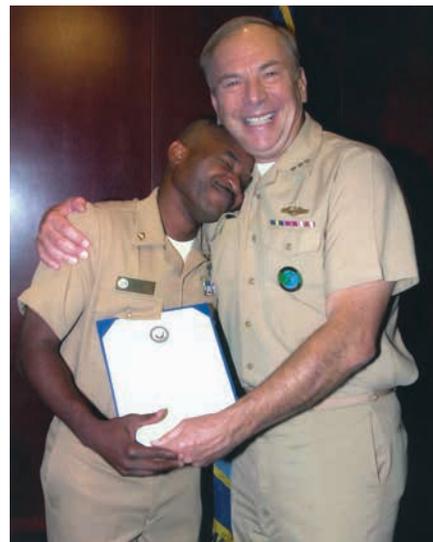
Ensuring safe operations requires extremely careful management focused on eliminating risk. On the other hand, we are warfighters, and warfighting requires bold

risk-taking. So our leaders must be prudent, diligent, detail-oriented managers, and at the same time, they must be prepared to put everything at risk to accomplish the mission. Only the best leaders can be careful managers as well as bold leaders—and know which one is required in any given situation.

That's a lot to ask, but the Submarine Force has for many years produced leaders who were adept at moving along the continuum between peacetime management and combat leadership. The Design for Undersea Warfare reminds us that we must

have both. We have certainly had them in the past, and there is absolutely no reason we can't continue to do so for the foreseeable future. All it takes is to remember who we are, and how we got that way.

Vice Adm. Al Konetzni Jr. (ret.), known to many Submariners as "Big Al, the Sailor's Pal," served from 1998 to 2001 as Commander, Submarine Force U.S. Pacific Fleet. He retired in 2004 as Deputy Commander of U.S. Fleet Forces Command.



"A successful organization encourages its members to anticipate the satisfaction and rewards of achievement, not to dwell on the penalties of failure." Photo courtesy of Vice Adm. Konetzni

Our Next Finest Hour

Creating a Submarine Force That Thrives on Boldness and Initiative

Undersea Warfare (USW) is a wide-ranging topic that covers many subjects that are vital to the Nation's maritime and defense strategies. The major parts of the overarching USW framework are Submarine Warfare, Antisubmarine Warfare, Subsea Warfare, and Mine Warfare. All areas are very technical and complex in nature requiring those who serve in them to be technically proficient as well as innovative and adaptive to meet ever-changing requirements. Technical competency and procedural compliance are the bedrock of the Submarine Warfare aspect of USW, especially nuclear submarining. Submarines today are vastly complex warships containing very advanced and dangerous technology that if not operated and maintained properly would present a danger to the crew and public. From day one of Nuclear Power School and the Basic Enlisted Submarine School every Submariner, nuclear-trained or otherwise, is drilled and re-drilled on the importance of procedural compliance. This has allowed the U.S. Navy's nuclear submarines and surface ships to operate with a perfect safety record for over 60 years, an incredible achievement. However, today's Submarine Force puts the majority of its emphasis on to-the-letter-procedural compliance. In doing so we have drifted away from the equally important other half of the equation—creativity and increased personal responsibility—that created the independent, innovative, war-winning Force that almost single handedly crippled the Imperial Japanese Navy's merchant fleet. In order to retain our dominance in the Submarine Warfare arena as the rest of the world catches up in technology, and in order to ensure the Submarine Force is ready when it is called on for its Next Finest Hour, the Submarine Force must put a greater emphasis on boldness and innovation at all levels while maintaining its spotless engineering safety record.

Some History

Arguably, the most successful the United States Navy's Submarine Force has ever been was during its Second World War operations against the Imperial Japanese Navy (IJN). The relatively small Submarine Force accounted for 55 percent of all Japan's merchant losses,¹ effectively strangling the island nation and playing a major role in the end of the war. This war-ending success against the IJN merchant fleet did not come quickly or without cost. The beginning of the war in the Pacific saw a peacetime Navy struggling to quickly and effectively come to a wartime footing. Many older commanders of submarines were overly cautious, nervous, and unwilling to take the calculated risks that would lead to success. For example, operating constantly submerged provided the submarines a way to remain safe and undetected, but made it impossible to catch up to the faster moving surface ships.

This problem of timid commanders and senior officers who were more concerned with their own advancement and appearance than success of their forces was not exclusive to the Submarine Force. In fact, in January 1941 then Vice Adm. King, Commander-in-Chief Atlantic Fleet, issued Cinclant Serial 053 with the subject line: Exercise of Command—Excess of Detail in Orders and Instructions. In this message Vice Adm. King lays out his growing concern of the practice of senior officers providing too much “how” in their orders to subordinates and of senior officers failing to allow their subordinates to gain the extremely vital experience that only comes from trying—and failing.² He lays the blame for this culture of fear and micromanagement on not only the desire of senior commanders to have their commands entirely beyond reproach, but also overly



“If the members of the Submarine Force are not habituated to think, to judge, to decide and to act for themselves, in their several echelons of command—we shall be in sorry case when the time of ‘active operators’ arrives.”

—Vice Adm. King

exuberant staffs which encroach on the reason for being of the ships and divisions they are meant to support. Two other key contributors were anxiety at all levels regarding exercising initiative for fear that it may influence promotion, and the creation of a coddled group of commanders who were too used to being told how to do something that they lost the ability to think for themselves.

Self-Assessment

It is prudent to examine our current Force using the lens provided by Adm. King's message to see where we stack up. The Design for Undersea Warfare is a good place to begin. Published by Commander, Submarine Forces in July 2011, it took a hard look at how the Submarine Force operates and identified four areas that need to be improved:

- 1) The current approach to assessments and inspections rewards cyclic and temporary—excellence, vice sustained and broad excellence.
- 2) TYCOM and ISIC efforts tend to limit a commanding officer's freedom and flexibility by sharing responsibility and accountability. Excessive administrative distractions are burdensome, also.
- 3) Insufficient emphasis is given to developing creativity and initiative.
- 4) Solutions to problems tend towards bureaucratic, process-dominated approaches.

Comparing these with the causes listed by Adm. King shows that the current Submarine

Force more closely resembles its pre-World War II version, than the highly successful Force developed during the war years. Ship's attitudes and priorities are focused on the short-term success of doing well on an external inspection since those scores play a major role in fitness reports, rankings, and promotions. The well-meaning interventions of TYCOM and ISIC staffs have resulted in the dilution of the authority of the commanding officer. Adding to the areas identified by the Design for Undersea Warfare, the procedural compliance (and sometimes reliance!) mentality brought about by the Submarine Force's strong nuclear engineering background has created an incredibly administratively burdensome process that only adds to the issues identified in the second part of 2) and 4). Well-meaning ideas have been applied blindly and without the filter of independent, creative thought creating the present situation.

Finally, the problem with the potential to cause the most damage to the Submarine Force's goal of maintaining its dominance of the undersea environment is the lack of emphasis on developing individual initiative and creativity. Procedural compliance is an incredibly important part of submarining and its importance and continued relevance to the Submarine Force must not be diminished. Technical mastery is a necessary condition to enable operators to safely fight an incredibly complicated warship, but it alone is not sufficient to maximize the war fighting potential of the Force. As such, it must not be emphasized at the cost of developing officers and sailors who can adapt, improvise, and overcome any situa-



USS Barb (SS 220)



USS *Wahoo* (SS 238) Commanding Officer Lt. Cmdr. Dudley W. "Mush" Morton speaks with his Executive Officer Lt. Richard H. O'Kane on the bridge.

This resulted in Commanders like the legendary Eugene Fluckey and Dick O'Kane who were not afraid to take risky chances or push the edge of the envelope. Free from shore based micromanagement they created tactics from their own experience and imagination. They took calculated risk after calculated risk and they pushed the envelope with one goal in mind—bringing the fight to the enemy and destroying him wherever he was to be found. They helped create the finest hour of the U.S. Submarine Force.

The implication here is clear. The World War II Submarine Force turned itself around with actions closely aligned to Adm. King's message. The modern Submarine Force can, and should, absolutely do the same thing. The groundwork for this has already been laid. The initial purpose statement of the Design for Undersea Warfare immediately aligns itself with the concepts for success outlined by Adm. King by saying that it is meant to be "specific enough to clearly define the objective, while being flexible enough to encourage initiative and boldness throughout the Force—at all levels—in the attainment of these goals."⁴ It also encourages "increased emphasis on creativity and innovation, sparked by initiative and a heightened sense of authority, responsibility, and accountability at the lowest capable level—even to the individual."⁵

The Design for Undersea Warfare is an excellent beginning to the changes that must be made to the way we operate and our culture to reshape the modern Submarine Force to continue its undersea dominance. The only directive phrase it contains sums this up perfectly saying, "The Design for Undersea Warfare is a framework for action. Read it, think about it, discuss it, and act on it."⁶ Adm. King would most certainly approve of this document since it provides guidance on what must be done, then utterly relies on individual commanders to successfully implement it.

Released in November 2012, Update One to the Design for Undersea Warfare continues to emphasize the importance of developing and training the individuals of the Submarine Force to ensure success. It quickly defines the Foundation of the Strength of the Submarine Force as being built on individuals with expertise, discipline, and initiative as well as leaders who are motivating, capable, and deci-

tion with which they are confronted. Adm. King sums this up perfectly saying if the members of the Submarine Force "are not habituated to think, to judge, to decide, and to act for themselves in their several echelons of command—we shall be in sorry case when the time of 'active operations' arrives."³

The United States has, today, the world's greatest Submarine Force. The people are dedicated, hard-working, and intelligent. The technology is the best in the world. However, the rest of the world is catching up. Traditional rivals such as Russia and China are continually improving and modernizing their submarine fleets while other nations such as North Korea and Iran are emerging as potential adversaries by employing inexpensive but effective diesel and Air-Independent Propulsion technologies. Especially in this time of budget constraints and fiscal austerity, technology must not be relied upon to maintain dominance for the United States. We must look to our most valuable resource, that which carried us through to such success in World War II: the innovative, bright, and dedicated people who man our submarines.

Corrective Actions

Since today's Submarine Force bears an uncanny resemblance to the Force lambasted in Adm. King's message, his corrective actions can be logically applied to today's Force also. He lays out five corollaries at

the end to rectify these observed problems:

- 1) Adopt the premise that the echelon commanders are competent in their several command echelons unless and until they themselves prove otherwise.
- 2) Teach them that they are not only expected to be competent for their several command echelons, but that it is required of them that they be competent.
- 3) Train them—by guidance and supervision—to exercise foresight, to think, to judge, to decide, and act for themselves."
- 3) Stop "nursing" them.
- 4) Finally, train ourselves to be satisfied with "acceptable solutions" even though they are not "staff solutions" or other particular solutions that we ourselves prefer.

Vice Adm. Charles J. Lockwood, Commander, Submarine Forces Pacific, played a large role in the reshaping of his portion of the timid Force by championing technological upgrades to the submarine fleet and by replacing the older, cautious commanders with younger skippers who were willing to take calculated risks to defeat the enemy. Perhaps most importantly, he allowed them the freedom to operate as their in-situ judgment dictated. In short he almost exactly implemented the key points from the King serial.

sive.⁷ Additionally, the first two focus areas delineated for 2013 talk about enhancing CO initiative, and training watchstanders and teams to develop the necessary skills to confront uncertainty, complexity, and urgency.⁸ Finally, and most importantly, in the “Commander’s Guidance to Submarine Commanding Officers” section, the document acknowledges and specifies that it is only there to provide general guidance. Authority, and responsibility, to implement the Commander’s Intent is entirely handed over to each commanding officer to tailor to his or her specific situation and command. Similar guidance is promulgated to those who support the forces afloat. They are directed, above all else, to respect and defend the authority and responsibility of ship’s commanding officers and to use their own initiative to accomplish this.

Conclusions

The Design for Undersea Warfare and its recently released update are only a framework and the ultimate success and reshaping of the Submarine Force depends on command- and individual-level implementation. These documents can become a license to wildly innovate until our Submarine Force looks like we want it to. They are both a license and tool to change the status quo for the better.

For the individual members of the Submarine Force it is important to not be afraid to challenge the current system with new and innovative ideas. The commonly heard phrases “that’s how we’ve always done it,” “living with a problem,” or “I could do it way better than this procedure tells me to” must become a call to action instead of only a gripe. Our legendary wit, problem solving skills, and refusal to be beaten are tools without equal. Apply them to fixing the issues

USS *Seawolf* (SS 197)



we all despise the most. Deck plate solutions work on a daily basis and they will work even better when adapted and formalized for Force wide use. We can always do something better.

For the leaders it is absolutely crucial to support and encourage those who work for us to do just that: challenge the system. We are constantly told that we have the best Sailors in the world so we must use them. Commanders who take pride in furthering and implementing the innovative ideas of their subordinates, while applying their own experience and ideas to innovate themselves, are the Fluckeys and O’Kanes of the future. Leaders who are afraid to challenge the current system, or who are too complacent to wonder how something could be done better, must become the forgotten and replaced commanders of Vice Adm. Lockwood’s era.

Furthermore, leaders must not only teach every member of the Submarine Force the importance of innovation, but to mentor them as they develop the necessary skills. The qualification process, training plan, and inspection metrics must be revised for an increased emphasis on creativity by every watch stander. An environment that is tolerant of honest mistakes and failure must also be created. Failing is not something to be feared as long as the effort was honest, well thought out, and properly implemented. The long line of successful U.S. military operations has its own list of failures—and would not exist without those failures. The best and longest remembered lessons come from the ashes of failure. We must not let fear of failure, or criticism from that failure, prevent us from trying—and learning.

To be clear, this is not a diatribe against procedural compliance, nor is it meant to diminish the great importance of technical mastery. Both of those doctrines make up a large portion of the bedrock of the Submarine Force and are now, and have always been, irreplaceable. It is not an easy problem to train sailors for the most technical job in the military while still asking them to be innovative and creative under pressure, but then again the leaders of the Force must remember that very few of us joined up because submarining was the easy path. So, the problem we face is not one of “either/or” but one of “both/and.”

The Submarine Force of the Second World War was transformed by the necessity of war



USS *Wahoo* (SS 238)

as well as the guidance of an amazing group of Sailors willing to change the status quo to achieve the results required. Our current Force is not at war, but is engaged in many missions vital to national security and as such must rely on us to supply the change necessary. The Design for Undersea Warfare, with its emphasis on individual authority, creativity, and responsibility is an excellent framework to begin this very necessary shaping of the attitude of the Submarine Force towards one of boldness and calculated risk taking. But, just as it was in World War II, it will be the individual Submariners who make this change, not reliance on the governing documents themselves. We all must implement and personally embody the tenets of Adm. King’s message and the Design for Undersea Warfare to ensure our continued dominance in the undersea domain. Our Next Finest Hour may be coming sooner than anyone thinks.

End Notes

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A Fighting Ship of the Highest Order

Procedural Compliance: The Bedrock for Bold and Deliberate Action

In the July 2011 publication *Undersea Warfighting*, Commander, Submarine Forces summarizes the inspiring history of the U.S. Submarine Force—from the innovative designers and builders of the USS *Holland*, to the bold, tenacious heroes of World War II and the Cold War—and the necessary attributes of the Undersea Warrior that made this history possible. *Undersea Warfighting* describes the characteristics required by the Undersea Warrior to be successful in the hostile and unforgiving environment we operate in. These characteristics, proven in the crucible of WWII and the tense patrols of the Cold War, are still applicable today. The submarine crews of our time still have that spirit—manifested by the crews who provided direct-fire support over the past 20 years in Operations Desert Storm, Enduring Freedom, Iraqi Freedom, and most recently, Odyssey Dawn. The actions of the brave and daring men who served before us provide a foundation of lessons on which we build today; their success grounds every Submariner with a sense of purpose and camaraderie even during times of peace.



At times, and rightfully so, our young leaders look back at our submarine heroes to find a sense of purpose for their own service. Long days and months of facing the challenges of being a junior officer (e.g. qualifying, standing watch, learning to be a watch leader, becoming part of the team, etc.) have led some to question their readiness to fight in a wartime environment. They compare today's Submarine Force culture to a risk-averse pre-WWII Submarine Force, and extrapolate the follow-on ineffectiveness of the Force during the early days of the war to suggest dire consequences for our present Force in the face of wartime challenges. Their critique typically continues that pre-war submarine commanding officers were too risk-averse and procedurally strict to be effective, and the battle in the Pacific was only won by replacing the timid and weak with the bold and daredevil heroes every submarine Sailor admires—men like Morton, Fluckey, and O'Kane. These commanding officers very much deserve their heroic status, but historical contingences muddy the comparison between the WWII Submarine Force and the Submarine Force of today. The theory that today's Submarine Force has lost the warfighting edge by regressing back to a peacetime standard of apprehension requires deeper review.

Every few years, an article or paper is written arguing that our senior leaders have bred out boldness and creativity by taking a strict approach to procedural compliance—in other words, that the officers commanding today's nuclear submarines lack boldness. The argument suggests that this lack of boldness is caused by our culture of procedural compliance and that following the Submarine Force's procedures, doctrine, and tactics in some way makes our senior leaders timid, even cowardly. However, procedural compliance and a propensity for bold action are not mutually exclusive, and an examination of why our young leaders draw this conclusion is worthwhile.

The Historical Contingences of Boldness: Untested Weapons and Tactics, Technological Disadvantage

In 1942 and 1943, many commanding officers were removed for being ineffective in taking the fight to the Japanese. These officers were replaced by others who quickly became more effective. All too often, when this history is cited, the latter's boldness alone is exaggerated and their success is attributed to being less timid. The Submarine Force of the pre-war period—still a relatively young and inexperienced Force—was technically and tactically unprepared for war. Overestimating the effectiveness of antisubmarine air and surface forces, their doctrine was conservative, and there was little appetite for risk in peacetime training; night exercises were prohibited. Prior to the beginning of the war, the Navy was officially opposed to unrestricted submarine warfare, which carried unpleasant associations with the German *U*-boat campaigns of both World Wars. As a result, there was no existing doctrine or tactical guidance for antishipping attacks. Additionally, the Force would soon learn that its primary torpedo—which was not thoroughly tested and exercised—was plagued with problems. Submarine crews were quite simply not ready to face the enemy at war.

The commanding officers and crews who achieved success later in the war, and are often contrasted with the "cautious" and ineffective men of the early war, were operating under different circumstances. They had months or years of experience at war and had witnessed the surprising ineffectiveness of both Japanese antisubmarine forces and pre-war American doctrine, and were better able to appropriately weigh the risks of greater aggression. Over time, they were equipped with better weapons and better tactics, techniques, and procedures for using them. The narrative that early-war skippers were old, passive, and cautious, while the heroes that arose later in the war were young and aggressive ignores that the Submarine Force as a whole learned how to fight in the first year of the war.

The limitations faced by our Force early in WWII have little equivalent in today's Submarine Force. Our doctrine is grounded in real world lessons learned and is routinely exercised. Our weapons are effective and exhaustively tested. We suffer no cognitive dissonance resulting from a divergence between our likely wartime role and the laws of war, and have no lack of doctrine discussing our wartime employment. Perhaps most importantly, our submarines operate every day in forward areas, "preparing the

"When a natural leader and born daredevil such as Mush Morton is given command of a submarine, the result can only be a fighting ship of the highest order, with officers and men who would follow their skipper to the Gates of Hell."



Vice Adm. Charles Lockwood
on Lt. Cmdr. Mush Morton
and USS *Wahoo* (SS 238)

battlespace” and practicing the skills and tactics critical to wartime effectiveness. The Submarine Force of 2013 is not the Submarine Force of 1941.

Another area of significant change is in the Submariner’s technological matchup against the adversary. Along with the changes in weapons and tactics, advancements in submarine technology have increased the potential of the submarine warrior to successfully engage today’s adversaries. Technological improvements have made every part of the ship more capable, from the nuclear powered propulsion plant to the electronic combat systems (sonar, fire control, and electronic support). No longer is the commanding officer limited by diesel or battery propulsion; it was nuclear power that made our ships truly submarines vice submersible surface ships. These advances tipped the scales significantly in the submarine’s favor, enabling greater stealth and lower risk during antisurface attacks. Any comparison of the boldness of the heroes of WWII to the boldness required to succeed in a conflict today is clouded by these technological advancements, and is somewhat like comparing the bold tactics of a musket-carrying minuteman during the Revolutionary War to those of a U.S. Marine in the Iraqi desert. The submarine is no longer a blunt object; it is a razor sharp implement in battle, and requires our submarine crews to have a different set of skills and procedures than their predecessors.

Falklands Conflict —1982

On April 3, 1982, HMS *Conqueror* (S 48) got underway from Faslane Naval Base, Scotland, one day after Argentina invaded the Falkland Islands. Soon after arriving in the vicinity of the Falklands, *Conqueror* found the light cruiser ARA *General Belgrano* operating as part of a surface action group (SAG). The British submarine operated in close proximity to the enemy vessels for two days, holding them at risk and avoiding counterdetection. Once ordered to attack, the fire control party on *Conqueror* refined their solution for hours before pulling the trigger. After *Belgrano* went down, *Conqueror’s* crew dodged attempts by the Argentine Air Force to locate her. She continued to patrol in the area, playing a valuable deterrent role, and the Argentinian fleet retreated to its bases for the remainder of the conflict.

Conqueror’s ability to complete its mission required strict adherence to procedures. When it came time for action the crew operated the ship as they were trained. During the 21-day transit from Scotland to the Falklands the CO and XO made their preparations for war—18-hour training days were the regimen set by the leadership. Bold leadership was required by the CO and XO to motivate the crew into a wartime posture and to make them take their role in the war seriously. The crew doubted the need for *Conqueror* to train as hard as they did; when the order came, the ship was ready due to the strict training regimen driven by the commanding officer.

Boldness and Procedures: Not Mutually Exclusive

Our WWII commanding officers followed procedures. Early in the war, adherence to the outdated procedures and tactics contributed to their ineffectiveness. The new, more effective commanding officers did not abandon their procedures either, but the guidance had evolved and incorporated the lessons learned from the early patrols, and their disciplined execution of that improved guidance led to success. If our WWII heroes had not followed strict, disciplined and practiced torpedo firing guidance, any bold and dare-devil action to get into a firing position would have fallen short. Their boldness was not at odds with procedural compliance; one required the other to be successful in battle.

Accepting procedural compliance and thorough preparation as the bedrock of our Force does not preclude the propensity for boldness, but fosters an atmosphere that prevents bold decisions from becoming rash behavior (e.g. 2001 USS *Greeneville* (SSN 772) collision). Operating equipment and systems by procedure provides operators the bandwidth for innovative and clever response to unforeseen events during battle. The procedures, doctrine, and tactical guidance are the base plans. A crew that cannot operate efficiently by those plans prevents the commanding officer from successfully executing bold decisions in battle. The “fighting ship of the highest order” resulted from both boldness and adherence to guidance and procedures—the foundation of safe operations.

Boldness Rightly Understood: Deliberate Decision Making

To demonstrate boldness—the willingness to act decisively in the face of risk to accomplish a mission—the leader should not act without evaluating that risk. To prepare his team for risks, the commanding officer should put mitigating measures in place to keep his ship and team safe and provide the best chance of success. This deliberate decision making, with sufficient preparation, makes the bold decision rarely necessary in peacetime—though the commanding officer’s intuitive decision-making will often be called for.

During peacetime, the commanding officer must prepare himself, and his crew, to be ready if hostilities arise to make bold decisions to accomplish a wartime mission.

The commanding officer can do this when risk to the crew is low (e.g. in the attack center) and by making deliberate decisions to meet our peacetime requirements. In peacetime, it is rare that the accomplishment of a mission requires action without evaluating and mitigating risk.

One example of deliberate decision making is the set of actions to get a submarine underway following an extended maintenance period. Before a submarine gets underway, the crew prepares the

ship in accordance with procedures. The commanding officer receives reports from the department heads and executive officer on readiness for underway—status of equipment, supplies, personnel, and any discrepancies to the optimal status—while managing a planned underway time. The individual ship's movement is woven into a complex schedule including multiple boats to meet national-level tasking. A delay in getting the ship underway may have ramifications to the schedule of other boats or result in the loss of an important mission. A submarine is a complex machine and will rarely be without some discrepancy when the ship gets underway. The crew is well trained to compensate for the discrepancies, and the commanding officer must make a deliberate decision on what is acceptable.

Once underway, operating in the local area, on mission or on patrol, the commanding officer is continually making deliberate decisions. At times, the commanding officer must force ingenuity and initiative by making the deliberate decision to keep his ship and team out to sea. A commanding officer with a deliberate attitude leads the crew to devise clever ways to solve problems that they never thought possible, and in turn allows the ship to continue to fight or complete its tasking. All the while, the commanding officer, having the utmost respect for the dangers inherent in operating a nuclear powered submarine at sea, makes decisions with the procedures and guidance in mind.

What Causes Our Junior Officers to Juxtapose Boldness and Procedural Compliance?

Why do some of our junior officers misunderstand procedural compliance as inflexibility, rather than as the bedrock foundation for bold and deliberate action? Are commanding officers clearly articulating the value of this foundation and illustrating when and where deliberate decisions were made? Do our commanding officers clearly explain how they would make bold decisions in battle? Do they use exercises or attack center time to demonstrate bold action? Are the lessons learned at the commanding officer's level fed back to our young officers? These questions could be valuable wardroom training topics.

Why do our young officers see boldness and procedural compliance as mutually exclusive? When we are young leaders our vision is mostly focused inward and we do not always see the difference between what it takes to operate and manage the submarine (internal operating procedures) and what it takes to succeed in battle (boldness and creativity grounded in the guidance). The Submarine Force relies on our junior officers to focus mainly on the internal operations of the ship while learning how the ship interacts with its external environment. Their internal focus is on the tasks that don't normally make the highlight reel, but do require perfecting the procedures and guidance—operating the complex machinery, entering contacts into the fire-control system, reporting contacts to the OOD, manipulating the ship's control surfaces. Internally, there is little need for boldness or creativity under normal conditions; but externally, deliberate action and sometimes boldness are required.

The role of the junior officer has always been critical to the success of the command. During WWII and today, the commanding officer is only successful in operating the ship if the internal processes are being managed well by the junior officers so he can focus on the external environment. "A fighting ship of the highest order" can only occur if deliberate or bold action is grounded firmly on the proper operation of the submarine.

Lt. Rob Szeligowski is the Flag Aide to Rear Adm. Barry Bruner, OPNAV N97, and previously served on USS *Maine* (SSBN 741) (B). Capt. (sel.) Anthony Carullo is the Executive Assistant to Rear Adm. Bruner, and previously commanded USS *Greenville* (SSN 772).

"A commanding officer with a deliberate attitude leads the crew to devise clever ways to solve problems that they never thought possible, and in turn allows the ship to continue to fight or complete its tasking. All the while, the commanding officer, having the utmost respect for the dangers inherent in operating a nuclear powered submarine at sea, makes decisions with the procedures and guidance in mind."

Navy's New High-tech Fitness Program Transforms Physical Training Practices Aboard Submarines



"NOFFS is the perfect solution for staying physically fit in the confined spaces of a submarine," said Master Chief Petty Officer of the Navy Mike Stevens. "It combines smart nutrition and a viable workout to provide our Submariners with the 21st Century tools to continue to be an active part of our Navy's culture of fitness. Stay healthy, stay fit, stay Navy. HOOYAH Submarines."

Photo by MC1 Ian Anderson

As a part of the 21st Century Sailor and Marine Initiative, Secretary of the Navy Ray Mabus introduced the Navy Operational Fitness and Fueling System (NOFFS) in March 2012 as the U.S. Navy's SECNAV-directed performance training system. NOFFS has enabled the Navy to provide standardized, evidence-based exercise performance and nutrition information to more than 425,000 Sailors worldwide.

NOFFS employs a new methodology to keep Sailors ashore and afloat in top physical condition. Based on sports science training philosophies that have produced multimillion dollar athletes, NOFFS is designed to improve operational performance, decrease the incidence and severity of musculoskeletal injuries, and provide foundational nutritional guidance for Sailors. This world-class performance training system was developed using the latest sports science methodologies combined with the foundational operational movement patterns of Sailors.

"Developing a performance training system for the submarine community was our greatest challenge," said Capt. John Newcomer, Commanding Officer of the Center for Personal and Professional Development (CPPD). "The confined space and equipment limitations are, by far, the greatest with our Submarine Fleet."

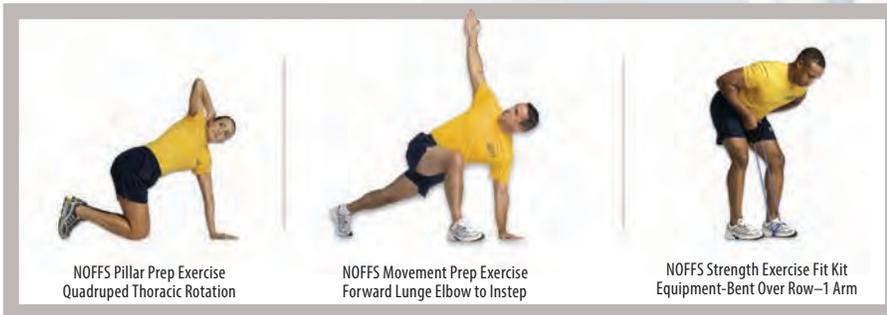
The Navy's NOFFS development team includes over 45 human performance, physical fitness, nutrition, and injury prevention experts, as well as Athletes' Performance—a recognized international leader in the human performance industry. All of the aforementioned experts worked closely with over 750 Sailors from the submarine and surface communities to identify the very specific needs of this population. Sailors aboard the *Los Angeles*-class attack submarine USS *Boise* (SSN 764) provided specific guidance and recommendations for performance training while underway on a submarine.



Example of how NOFFS movements prepare Sailors for SUBFOR operational performance
 Exercise Photos © David Zickl 2009

Photo by MC3 Chelsy Alamina

Example of how NOFFS movements prepare Sailors for SUBFOR operational performance



Photos © David Zickl 2009

“The NOFFS system offers every Sailor, regardless of fitness level, the ability to personalize a training regimen specific to their nutrition, strength, flexibility and cardiovascular training goals,” said Chief Hospital Corpsman (SS/FMF) Eric “Billy” Staley, former staff hospital corpsman for Commander, Submarine Force Atlantic. “As the Sailor’s fitness level increases, the program is easily adapted for continued gains in fitness.” The native of Clayton, Ind., recently transferred to the Gold Crew of the *Ohio*-class guided-missile submarine USS *Georgia* (SSGN 729) in Kings Bay, Ga. “On board submarines, little space is available for large amounts of fitness equipment,” said Staley. “The NOFFS system’s platform-specific training series allow Sailors to be able to maintain, or improve their fitness level in any operational environment regardless of the amount of fitness equipment that is available.”

NOFFS was initiated as a response to a demand signal from the fleet to improve the operational performance of Sailors by linking fitness to their daily tasks, with due consideration given to space and equipment limitations. Lifting, pushing, pulling, and carrying require strength training, multi-directional movement training, movement preparation, cardiovascular training, and recovery training.

“There is a consummate paradigm shift in physical development from a traditional fitness model of isolated, single-joint resistance to an archetype in integrated training systems based on movement including: Restoring Movement, Training Movement, Fueling Movement,” said Cmdr. Denise Gechas, director of population health at Navy and Marine Corps Public Health Center.

The focus of this system is optimized *operational* physical performance and fueling (nutrition). NOFFS includes more than 90 exercises that eliminate the guesswork for Sailors when exercising, with an underlying

NOFFS Bench Press Strength Exercise

The Bench Press is a NOFFS exercise identified as a “full equipment” strength option in both the surface ship and large deck series.

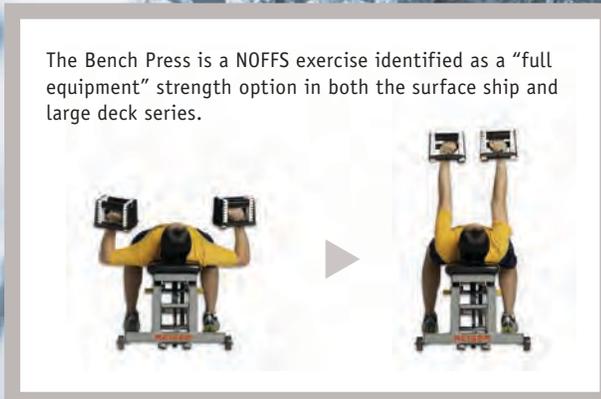


Photo by Mass Communications Specialist PRST Class Jason Swink

focus on the prevention of musculoskeletal injuries. “NOFFS training has been very helpful in keeping Sailors in the mindset of living a healthy lifestyle. Proper mechanics in exercising will prevent injuries that can cause loss of man hours and training, and cost the medical system a lot of money. NOFFS is working well and is being introduced at the right level,” said Master Chief Culinary Specialist Scott Brody of Naval Submarine School, New London, Conn.

The Trident Refit Facility in Kings Bay,

Ga., uses NOFFS on a weekly basis, according to Chief Machinist’s Mate Orlando Thomas, a Command Fitness Leader. “I have seen more command participation and fewer injuries since incorporating NOFFS into our PT. My Sailors think NOFFS is phenomenal,” he said.

Jennifer Person-Whippo, U.S. Naval Supply Systems Command’s nutrition program manager said, “The Fueling Series gives Sailors practical tools on nutritional fundamentals, meal planning, portion awareness,

and energy management. NOFFS is all inclusive – teaching portion sizes, providing food lists of green, yellow, and red items, and female and male meal builders. These resources are critical in the success of fueling for performance and health of a Sailor.”

Master Chief Culinary Specialist Chris Nailon, Commander, Submarine Force staff culinary specialist, has seen results with NOFFS. “I not only promote the program with our Sailors, I’ve benefited from it personally. Specifically, I was able to shed

Commands and Organizations Across the Navy Participating in NOFFS Implementation:

Commander, Navy Installations Command (CNIC) Fitness, Sports, and Deployed Forces Support

- CNIC Website provides the NOFFS program to Sailors at <http://navyfitness.org/noffs>. Sailors can download illustrated exercise cards and view video demonstrations of each exercise to ensure correct technique. Through the “virtual trainer” on the Navy Fitness website, Sailors can “eliminate the guesswork” with their workouts.
- CNIC NOFFS Training Courses are available at installations Navy-wide. The four- to six-hour training course is available to CFLs and health/fitness professionals. Registration is available through the MWR fitness program. To locate a NOFFS instructor, or to inquire about an upcoming NOFFS course, visit: http://www.navyfitness.org/fitness/noffs/locate_trainer/
- CNIC Fitness, Sports, and Deployed Forces Support is leading fleet execution and has distributed NOFFS kits to both fleet units and MWR gym facilities. “Sailors have access to NOFFS anywhere in the world,” said Lisa Sexauer, director, CNIC Fitness, Sports, and Deployed Forces Support. Fit kits, one of the primary training tools used in the NOFFS program, have been released to operational platforms via Deployed Forces Support offices. Fit Kits and group training bags are available for check out at any Navy Fitness facility.

Command Leadership School (CLS) in Newport, R.I., began instructing prospective commanding officers and executive officers on NOFFS in June 2010. All incoming leaders attending the Prospective Commanding Officer, Executive Officer, or Command Master Chief/Chief of the Boat courses perform the NOFFS Submarine Series Level 1 as part of their physical training.

The Command Fitness Leader (CFL) curriculum for 2012 provides NOFFS training during a full-week standardized course. CFLs learn about NOFFS and participate in a complete NOFFS training session. There are more than 5,000 command fitness leaders and assistant command fitness leaders throughout the Navy.

Naval Supply Systems Command continually provides NOFFS training to the fleet. NAVSUP uses NOFFS Fueling as its primary resource for nutritional instruction. “The NOFFS program has proven to be a great healthy living asset for submarine Sailors. This program blends together the complexity of developing a workable exercise routine while offering some simple, easy-to-follow nutritional guidelines,” said Nailon. “And the addition of a NOFFS smart phone app was certainly a nice touch to market the program to our tech-savvy Sailors. Good health only comes when you are eating right, dieting, and exercising the right ways.”

Naval Submarine School, Submarine Base (SUBASE) New London, Conn., now offers a NOFFS indoctrination program. “We are meeting bi-weekly with Basic Enlisted Submarine School (BESS) students and have helped 1,032 already,” said Lindsey Wolfram, SUBASE New London’s former assistant athletic director. The New London Fitness Program has trained more than 84 CFLs in NOFFS instruction since 2011. NOFFS instructor courses continue to be offered the third Tuesday of every month. “The goal is to expose every SUBSCOL student to NOFFS methodology before branching out into their individual commands,” said Kevin Boedigheimer, SUBASE New London’s athletic director.

The Submarine Electronic Computer Field (SECF), a branch of SUBSCOL, also has reoccurring NOFFS gym sessions. “In the past six weeks, we have worked with 1,179 SECF students, and 12 of their instructors have gone through the NOFFS CFL/instructor course,” said Penelope Donahue, NOFFS Certified Fitness Instructor at SUBASE New London.

Navy Recruiting Command (NRC) support is led and positively influenced by Rear Adm. Earl Gay, Commander of NRC; Force Master Chief Earl Gray; and Navy Counselor Master Chief Jimmie Holt, national chief recruiter, Navy Recruiting Region and District leadership teams, and the Recruiting School (NORU). NRC, through NORU, has implemented weekly NOFFS physical training for all students and staff members since April of 2011. NORU’s Fitness Enhancement Program (FEP)/Enhanced PT trains those assigned and volunteers twice per week in NOFFS (averaging 25 students/staff members per session). Total student throughput at NORU is more than 1,300 yearly. In FY 2012, more than 400 command members distributed throughout 26 Navy Recruiting Districts received NOFFS training by CNIC fitness instructors. “The NOFFS system, and the resources available on <http://navyfitness.org/noffs>, is an outstanding physical fitness training system for Navy Recruiting and its distributed/national force,” said Victor Licause, retired Master Chief Special Warfare Operator, who is currently Navy Recruiting Command’s Physical Fitness program manager.

Navy Health Promotion Training is a primary component of the Navy’s newly launched health promotion and wellness campaign, which is directly aligned with the National Prevention Strategy Strategic Plan. The active living, injury/violence prevention, and nutrition programs emphasize the NOFFS system. Webinars promoting the NOFFS system are also delivered by the Navy and Marine Corps Public Health Center (NMCPHC), the organization responsible for leading the Navy’s health and wellness campaign. <http://www.med.navy.mil/sites/nmcphc/health-promotion/Pages/default.aspx>

Recruit Training Command (RTC) Great Lakes has incorporated NOFFS exercises into their new PT instruction, and the RDC C School uses NOFFS during their weekly physical training sessions with the incoming “blue ropes.”

about 25 pounds and reduce my 5K finishing times by about 10 minutes. I've just completed my fifth half-marathon," he said. "The program has completely changed my life with regard to living a healthy lifestyle. Creating a healthy lifestyle doesn't have to mean drastic changes. In fact, I think drastic changes almost always lead to failure. With making small changes in how one lives each day, it can lead to big rewards. Living a healthy lifestyle can do more than prevent disease. I really believe it can also help you have more energy and stamina, stay slim, be more alert, fight stress, and ultimately live a longer life."

NOFFS supports the 21st Century Sailor and Marine initiative designed to maximize individual Sailors' and Marines' readiness, resiliency and combat effectiveness. "I think that with the increased focus on a 'culture of fitness,' NOFFS gives Sailors the tools and knowledge to make physical training a part of their lifestyle," said Senior Chief Sonar Technician (Submarines) Erik Gemaly, assigned to Naval Submarine School.

NMCPHC Commanding Officer Capt. Michael Macinski said, "NOFFS is the next significant step in promoting a Navy culture of fitness. NOFFS represents this training system as a professional medium to take care of the Navy's greatest asset: its people."

A NOFFS application is available for iPhone and is under development for iPad. As of December 2012, the application had been downloaded over 17,000 times and had an average user rating of 4/5 stars.



For further information on NOFFS, download the NOFFS application or visit the NOFFS website at: <http://www.navyfitness.org/noffs>.

For addition information on active living, nutrition, and injury prevention programming visit the Navy and Marine Corps Public Health Center (NMCPHC) Health Promotion and Wellness Website: <http://www.med.navy.mil/sites/nmcpHC/health-promotion/Pages/default.aspx>

Diana Strock, MAT, ATC, is the Senior Advisor for Human Performance & Public Health at the Center for Personal and Professional Development in Virginia Beach, Va., and Program Manager for Physical Fitness & Injury Prevention at the Navy and Marine Corps Public Health Center in Portsmouth, Va.

"NOFFS is all inclusive—teaching portion sizes, providing food lists of green, yellow, and red items, and female and male meal builders. These resources are critical in the success of fueling for performance and health of a Sailor."



The handouts pictured above represent part of the five areas of nutritional focus in the NOFFS Fueling Series. This content for the Navy Fitness and Fueling Series is designed to help Sailors achieve their goals by giving them the tools to make choices that will result in the energy they need to perform their jobs.

SUPSALV Restores Diving Capability

On May 11, 2012, a few miles off Panama City, Fla., a diving bell containing three divers from the U.S. Navy Experimental Diving Unit descended slowly and steadily through the darkness of the Gulf of Mexico far below the depth that sunlight can reach.

Increasing water pressure compressed the air inside the diving bell, which was open to the sea, so more air was released into the bell to keep the volume of air constant and prevent seawater from entering. As the increasing pressure raised the saturation point of the diver's bodies, their tissue absorbed additional gases from the air. Therefore, the mixture of gases within the capsule's air required alteration during the descent to maintain the optimal mix for working at depth.

Finally, the divers reached their goal, a depth that no U.S. Navy diver had attained in an open diving bell since the 1970s. One by one, they left the confines of the bell and took up positions on a diving stage already positioned at the target depth. "We made it!" one of them exclaimed over a voice link to their support team on the surface far above. The last time U.S. Navy personnel had reached comparable depth in an open bell was in 1975, when a two-man team performed a saturation dive to 1,148 feet with the MK 1 Deep Diving System.



Jonathan Gibson, Naval Surface Warfare Center, Panama City, Division

Another three-man team from the Experimental Diving Unit also completed a dive to the target depth. One of the teams conducted excursions from the bell at 1,001 “feet of salt water” (FSW), and the other at 1,004 FSW. These successful dives enabled NAVSEA’s Supervisor of Salvage and Diving (SUPSALV) to certify the Navy’s new Saturation (SAT) Fly Away Diving System (FADS) to 1,000 FSW, reestablishing an important capability the Navy has not had for decades.

Upon completing their dives, the teams returned to the diving bell, which was raised to the surface so the divers could transfer to the deck decompression chamber (DDC). The divers spent the next nine days in the DDC, slowly decompressing from the demanding pressure of 445 pounds per square inch—the pressure found at depths of 1,000 FSW—back to the normal atmospheric pressure of the earth’s surface.

The Navy developed saturation diving in the 1960s as a safe way to extend bottom time for deep ocean salvage and submarine rescue, as well as recovery at depths up to 1,000 feet. Once divers reach the saturation point for the depth at which they will be working, it is much more efficient for them to continue at that pressure until the job is done rather than interrupt the work for days of decompressing.

Saturated diving requires a system that can keep divers under pressure when they return to the surface for food and rest. Therefore, the diving bell must have the capability to close off from the sea and maintain its internal pressure as it ascends. Once on the surface, the diving bell must be able to transfer the divers to a decompression chamber where they can live under pressure while not working at depth, and then eventually undergo the protracted decompression process after completing their work.

From the 1980s to the mid-1990s, the Navy had no such capability. With most of its afloat diving and salvage platforms having been decommissioned, including those that supported saturation diving, the Navy was forced to rely on commercial saturation diving systems to the extent it conducted such operations at all.

The process of bringing an approved open-water diving system back to the Navy began in 2003, when OPNAV’s Submarine Warfare Division (N87) proposed an acquisition program for SAT FADS and gained approval from the Chief of Naval Operations. “Bringing SAT FADS back to the Navy was essential to support the full range of Navy salvage and recovery

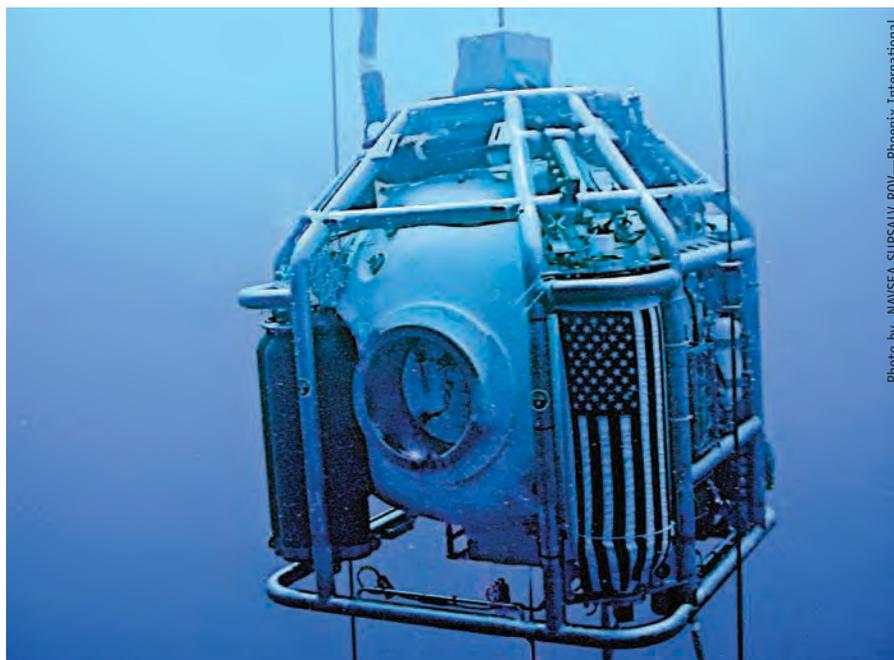


Photo by NAVSEA SUPSALV ROV—Phoenix International

In May 2012, a dive bell descends past 300 FSW on its way to making a historic 1000 FSW manned open ocean bell excursion by three U.S. Navy Saturation Divers in the Gulf of Mexico.

operations,” said Michael Dean, SUPSALV’s deputy director. “Those operations include crisis response from emergent causalities, as well as planned response in and around the world’s littorals and continental shelves.”

“SAT FADS provides the ability for Navy divers to work underwater longer, at greater depths, while avoiding large in-water decompression penalties,” Dean noted. “The saturation diving technique allows divers to postpone the lengthy decompression process until the completion of the mission when they can be safely decompressed in an on-deck recompression chamber.”

SAT FADS measures just 40 feet by 80 feet. It includes the deck decompression chamber—which serves as pressurized living quarters for the divers during an operation—the manned dive bell, a handling system, a command and control center, two auxiliary support equipment containers, and storage racks for bulk helium and oxygen. The entire system is air-transportable, so it can be rapidly transported anywhere in the world and loaded onto any suitable vessel of opportunity to conduct diving operations.

SAT FADS is designed to support six divers working on the ocean floor at a depth of 1,000 feet for up to 21 days, with an additional nine days of decompression. This capability makes it possible to support deep aircraft and ship recovery, or salvage operations. Three divers working in a team can work up to eight hours a day from SAT FADS during an operation, with another

three-man team aboard the unit able to rotate in and continue work with minimal interruption until the job is completed.

The new system surpasses the capability that was provided by the Navy’s last saturated diving platforms, the two decommissioned *Pigeon*-class submarine rescue vessels. These two dedicated vessels, decommissioned over a decade ago, allowed divers to operate only to a maximum depth of 850 feet, as compared to 1,000 feet for the new system. Air-portability makes the new system far more mobile and responsive. SAT FADS provides all this capability for a fraction of the total ownership cost of any previous ship-based saturated diving system.

“This system increases the Navy’s salvage and diving capabilities, allowing us to put U.S. Navy saturation divers to greater ocean depths than previously attainable,” said Paul McMurtrie, a retired Navy master diver now serving as the SAT FADS program manager. “This new asset will greatly increase our manned diving capabilities, as well as provide a one-of-a-kind training asset for future Navy saturation divers.”

“Having SAT FADS back in the Navy is very beneficial to the Navy diving community,” said Cmdr. Mark Matthews, SUPSALV’s director. “These are exciting times for the diving community, as we no longer have to wait for commercially available SAT systems in times of need, [and] we also can begin training other divers on our newly approved system.”

Brian Leshak is a Public Affairs Officer for the Naval Sea Systems Command.

When university teams bring underwater robots to compete on a challenge course at a beautiful harbor in Italy, it may seem like fun and games, but the Student Autonomous Underwater Vehicle Challenge-Europe (SAUC-E) is a serious proposition.

STUDENTS GET



Photo courtesy of CMRE

HANDS DIRTY,

SAUC-E 2012 judges evaluate the AUV from the University of Bremen, which placed fourth in the competition.

FEET WET

This year, SAUC-E brought teams from around the world to compete from July 6 to July 13 in the tidal basin of NATO's Centre for Maritime Research and Experimentation (CMRE), in La Spezia, Italy. Formerly called the NATO Undersea Research Centre (NURC), CMRE is a world-class scientific research and experimentation facility operating under the auspices of NATO's Science and Technology Organization (STO). It conducts scientific research and technology development focused on the maritime domain serving all nations of the NATO alliance.

CMRE, the Office of Naval Research (ONR) and ONR Global, and several other organizations sponsor events like SAUC-E to promote science, technology, engineering, and math (STEM) education and develop the high-tech workforce of tomorrow. The teams that enter these competitions must program robots to operate autonomously, which means no remote-control tethers or commands communicated to the vehicle once their run commences.

SAUC-E started in 2006, with the first competition taking place at England's Pinewood Studios. In 2007, the British

defense technology company QinetiQ hosted the event at its indoor Ocean Basin tank in Gosport, England. The competition moved to the Brest, France, facility of the French Research Institute for Exploration of the Sea in 2008, returned to QinetiQ in 2009, and has been held at CMRE since 2010.

Dr. Vladimir Djapic, the CMRE scientist who served as technical director for SAUC-E 2012, said the event is "designed as a mini-grand challenge for the autonomous underwater community which will create a suitable environment for inter-disciplinary interactions between academic researchers."

Teams may include up to 10 members, and can be made up of undergraduate and/or post-graduate students, faculty, industrial partners, or government partners. "Inter-disciplinary teams are encouraged," Djapic noted.

The 14 teams that came to SAUC-E 2012 prepared for months, building and programming their underwater robots to meet the challenging requirements of the course in the best time. Building, programming, testing, and operating a truly "hands-off" autonomous underwater vehicle (AUV) calls for a hands-on effort by every team member, because it requires the broadest possible range of expertise and talent in engineering, programming, and troubleshooting.

The CMRE location poses a special challenge. Unlike other underwater robotic vehicle competitions, which are conducted in pools, SAUC-E requires the robots to complete the assigned mission tasks in a

testing basin open to the waters of the Mediterranean—with real-world wave action, visibility limitations, salinity, tides, and sonar conditions.

Kevin Larose, who led Team *SONIA*, from Quebec's École de Technologie Supérieure (ETS), which bested 29 other teams in the 2011 International Robo-Sub competition in San Diego last summer, said they expected the environment at La Spezia to be more difficult. "Because of the water conditions here at CMRE, we have to rely less on vision and more on other sensors. The pool in San Diego is fresh water and has no current."

"Sonar is very reliable for determining distance, and compliments our DVL [Doppler Velocity Log] and IMU [Inertial Measurement Unit]," said *SONIA*'s mission manager François Campeau, "The experience we gained here using sonar will help us at Robo-Sub."

"We like both events," Larose added, "They're different." In fact, Team *SONIA* went directly from La Spezia to San Diego for Robo-Sub 2012 the following week, where they came in third and took home a \$3,000 prize.

For 2012, the CMRE basin was divided into two equivalent "arenas" to give the larger number of teams more time to practice with

SAUC-E competitor testing a robo-sub.



Photo courtesy of CMRE

equal obstacles. The assigned underwater tasks were:

- Submerging in a designated zone and passing through a gate to begin the run
- Inspecting an “underwater structure,” which involved following an underwater pipe
- Searching for a soft, acoustically and optically reflective “mid-water target”—a submerged buoy—determining whether or not a locating beacon was illuminated, and communicating that information to another autonomous vehicle via an acoustic modem
- Surveying a non-linear portion of the CMRE basin’s wall from a constant standoff distance
- Tracking CMRE’s ASV, a small catamaran, while it was in motion in the basin
- Surfacing in a designated zone to complete the run

- In addition, the teams were encouraged to “impress the judges” and earn extra points through a creative demonstration of some outstanding aspects of their system

The judges recognized winners in eight specialized categories: Rookie of the Year, Design and Innovation, Engineering, Best Use of Resources, Affordability, Smart Technology, Multinational, and Best Performance in the “impress the judges” Task.

Dr. Laurent Beaudoin, an advisor to the two teams from the École Supérieure d’Informatique Electronique Automatique (ESIEA), in Paris, noted that students participating in events such as SAUC-E obtain invaluable practical experience. “Scientists are judged by the number of papers they publish about their theories. They can prove their algorithms work in a perfect environment. But these students are dealing with real

currents, changing light as clouds pass over, and poor visibility in the water. They have a connection with reality that allows them to show what they can actually accomplish.”

Despite the months of preparation before arriving at La Spezia, some teams encountered daunting difficulties that taxed the skill and resourcefulness of every team member. For example, the team from the University of the West of England (UWE) suffered several setbacks and did not qualify. “We broke batteries, chargers, and soldering irons,” said UWE team leader Gareth Griffiths. “We had a cable explode—rather spectacularly, I might add—and our gasket seal was damaged and the pressure vessel flooded. We really couldn’t recover from the water getting inside.”

Nevertheless, the team kept on doing whatever they could to fix the problems and get the vehicle ready to qualify. “It was still a valuable learning experience,” Griffith says, “we’re already thinking about next year.”

The winner of SAUCE-E 2012 was the *SONIA* AUV fielded by the team from Quebec’s ETS. Second prize went to *HANSE*, created by a German team from the University of Luebeck. In third place was a team from France’s École Nationale Supérieure de Techniques Avancées (ENSTA), with the AUVs *SAUCISSE* and *SARDINE*. Germany’s University of Bremen came in fourth with *AVALON*, which had achieved the highest score in the qualifying round.

In addition to the satisfaction of bringing their underwater vehicles to the challenge and competing against the other teams, the top three finishers received €3,000, €2,500, and €2,000, respectively, to improve their equipment for future competitions. All other teams received €750 each for their effort and to encourage their continued improvement.

“The students of today are the scientists of tomorrow,” said CMRE Deputy Director Andy Pickup, “It’s rewarding to see them stretch their minds, explore new technologies and find innovative ways to solve common problems and engage the challenges placed before them.”

“I was impressed by their team spirit, teamwork, innovative creativity, and their spirit of sharing,” Pickup added, “Even though the teams are competing against one another, I have seen the cooperation between them.”

Capt. Edward Lundquist (ret.) is a principal science writer at MCR Federal in Arlington, Va.

AT ROBOTICS COMPETITION

A photo collage of the 14 robotic vehicles that competed at SAUC-E 2012. Created by Dario Sosa, Judge at SAUC-E ‘12.



Photo composition courtesy of Dario Sosa



“K” for Katastrophe

K CLASS SUBMARINES IN THE ROYAL NAVY

From their first appearance in mid-World War I, the Royal Navy’s *K*-class submarines were perhaps the most badly-conceived and ill-starred submersibles ever built by any nation. In both their original configuration and in the several derivatives that followed, the *K*-boats compiled an almost unbroken record of disaster and death, unredeemed by even a single instance of combat effectiveness. Spawned by a flawed tactical concept, implemented with immature and dangerous technologies, and kept at sea by the Admiralty’s stubborn refusal to admit the most obvious deficiencies, the *K*-class left in their wake a fascinating—even humorous—tale of operational and technical folly for which the query, “What were they *thinking?*” has seldom been more appropriate.

The Emergency of War

At the outbreak of World War I, the Royal Navy could field only 64 submarines, and of these, only 17 had more than coastal capabilities. With so much of the pre-war naval budget consumed by the “dreadnought race,” submarine construction had indeed lagged in the years 1910-1914, and need to “catch up” with the Germans became an immedi-

ate priority when war came in August 1914. Additionally, early German *U*-boat successes against both merchant shipping and Allied combatants soon created the perception of what we would call today an “asymmetric threat” to the primacy of the Grand Fleet in the North Sea, particularly when it was rumored that the Germans were building large, ocean-going submarines, capable of operating on the surface at 22 knots.

When First Lord of the Admiralty Winston Churchill brought the cantankerous Admiral “Jacky” Fisher out of retirement to become the First Sea Lord in late October 1914, Fisher first addressed the numerical “gap” by redoubling the construction of the tried-and-true *E*-class boats that had first appeared in 1911. Then, to match the high-speed German “threat,” he ordered the Director of Naval Construction, Sir Eustace Tennyson d’Eyncourt, to design a large submarine capable of 20 knots on the surface. Since no British diesel submarine had yet exceeded 16 knots, this was a major engineering challenge, and as early as late 1914, some consideration was given to propelling the new class with steam turbines. Indeed, the French had already fielded a steam-powered submarine,

Archimède, which had operated briefly—and unsuccessfully—with a British squadron in December. Moreover, in 1913, the shipbuilders, Messrs Scott of Greenock, had been retained to build an experimental “overseas” (i.e. long-range) submarine driven by steam turbines—*Swordfish*—and d’Eyncourt’s organization had themselves generated their own preliminary design. Fisher’s initial good sense led him to veto steam power for the new class, and d’Eyncourt’s bureau eventually settled in January 1915 on a large, ocean-going submarine powered by three *E*-class engines and supposedly capable of reaching 21 knots. This was the *J*-class, and eight were ordered immediately from three royal dockyards.

Meanwhile, several of the Admiralty’s senior “futurists,” among them Commodore Roger Keyes, Inspector Captain of Submarines, had suggested a tactical concept that would greatly expand the role of the submarine force in operating with the Grand Fleet. Keyes envisioned a line abreast of high-speed submarines working with the cruiser screen ahead of the main battle force—and thus positioned to submerge and attack an on-coming enemy battle line even before the latter could engage its British

counterpart. This scheme would require a submarine capable of 21 knots surfaced, even under typically adverse North Sea conditions. Both Admirals Sir John Jellicoe and Sir David Beatty, the Grand Fleet's Commander-in-Chief and the Battle Cruiser Force Commander, respectively, endorsed this idea and emphasized the urgent need for a high-speed "fleet submarine" to realize it.

Alas, it had already become apparent that the *J*-class boats could only reach 19 knots under the best of circumstances, and the possibility of a steam-powered alternative reemerged, proposed initially by Vickers, Ltd. In response, d'Eyncourt dusted off his own design from 1913, and in the spring of 1915, Fisher relented and agreed to authorize four new submarines built in accordance with an upgraded version of Sir Eustace's older plan. In June 1915, two each were assigned for construction to Vickers and the Portsmouth Dockyard, and although Fisher had resigned in mid-May over the Gallipoli debacle, the ill-fated *K*-class was born.

Steam, Speed – and Surprises

By every measure of the time, they were prodigious submarines. At 339 feet long and displacing 1800 tons surfaced—2600 tons submerged—they were larger than a contemporary destroyer. Powered on the surface by two oil-fired boilers and a pair of steam turbines, which developed 10,500 horsepower and also charged lead-acid batteries, they were fitted with four electric motors to drive twin shafts while submerged. Admiral Fisher had also insisted on an auxiliary diesel engine, and it was to prove a lifesaver on many occasions. The *K*-class could make nine knots underwater, with a submerged endurance of approximately 80 nautical miles at two knots, and a maximum design depth of 150 feet. The ships were originally armed with ten 18-inch torpedo tubes: four in the bow, four mounted transversely amidships, and two above water in trainable mounts for surface attacks. There were also two four-inch deck guns and a three-incher on the superstructure.

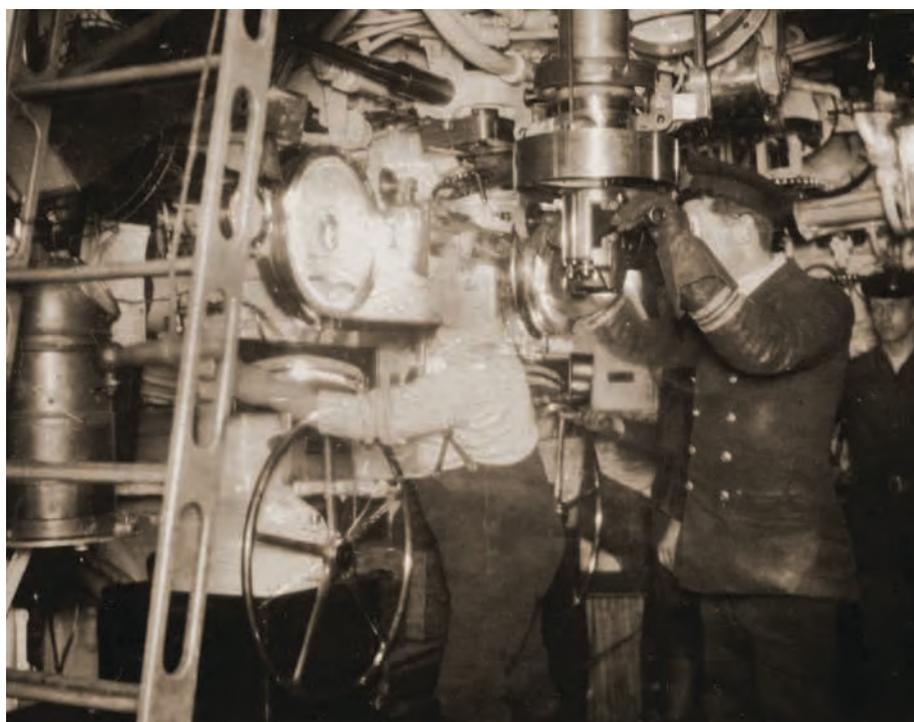
However, the most distinctive features of the *K*-class derived directly from their steam power plants. Aft of the Control Room and the Beam Torpedo Rooms were located successively the Boiler, Turbine and Motor Rooms. Above the boilers were six large hull openings—two funnel uptakes and four air intakes, all closed by motor-operated valves. Each of the air intakes was 37 inches in diameter. The five-foot high funnels themselves

protruded from a substantial superstructure aft of the conning tower and were tilted downward by electric motors and stowed in the superstructure prior to submerging. To dive the submarine, the boilers had to be shut down, the funnels retracted, and all the valves tightly seated to seal the Boiler Room while blowing ballast and converting over to electric drive. The residual heat was so fierce that the boiler spaces were totally uninhabitable during submergence, and had to be abandoned. A longitudinal passageway to one side thus had to be fitted to bypass the Boiler Room in moving between the two halves of the submarine. All the hatches, valves, hull penetrations, intakes, and uptakes necessitated by this Rube Goldberg arrangement led one experienced submariner to sum up the *K*-class boats with one pithy phrase: "Too many holes!" And on top of that, the *biggest* holes were located in a space that was normally unmanned while submerging.

The handling characteristics of the class, both on the surface and underwater, compounded their difficulties. Above water, the boats were insufficiently buoyant forward, and tended to plow into oncoming waves, shipping tons of water over the conning tower. The large, flat foredeck then tended to force the bow even deeper, as if the boat were teetering on the brink of a dive. Although the

entire class was later fitted with a bulbous, free-flooding prow known as a "swan bow," they were seldom able to operate at speed with the Battle Fleet in the North Sea except under the most favorable weather conditions. Both the forward deck gun and the superstructure torpedo tubes were unworkable and later removed. Even worse, the ships were easily—and regularly—pooled by following seas. Their overall wetness caused regular inundations of the Boiler Room through the funnels, extinguishing the fires and leaving the boats wallowing in the waves. With self-compensating fuel tanks open from below, seawater contamination of the fuel oil was also common, especially in rough weather, and caused frequent losses of power.

K-class handling was even more precarious in a dive. Because of their great length and weight, once they started down, they were hard to stop. Loss of depth control was common, and nosing into the bottom was a regular occurrence. Unless the submarine was very carefully trimmed, the hydroplanes and ballast tanks would frequently fail to correct her, particularly since the former were susceptible to unpredictable jamming. Fortunately, the *K*-boats operated mostly in the North Sea, where the water was shallow enough to keep them from exceeding their depth limits in the dive, but their erratic



Commanding Officer of HMS *K8* at the periscope in the Control Room.

Courtesy of The Royal Navy Submarine Museum, Gosport



Courtesy of The Royal Navy Submarine Museum, Gosport

Funnels being lowered as HMS K22 prepares to submerge.

behavior made operating with surface ships a dangerous business.

Even if all went well in preparing the ship for diving, shutting down the steam plant, sealing the hull, and ballasting down, the *K*-class submarines could rarely submerge in less than five minutes, and attempting to accelerate the process only invited dangerous mishaps, like flooding or Boiler Room fires. *K8* once succeeded in getting under in three minutes, 25 seconds, but a “crash dive” could not be said to have been part of their tactical repertoire.

However, to give credit where credit is due, the *K*-boats could indeed make 24 knots on the surface when the seas weren't too rough, and their record was not exceeded by any other submarines until the advent of nuclear power.

Despite their enormous size, habitability aboard the *K*-class boats was relatively poor. Although the officers had fairly capacious accommodations—and even a small bathtub—the crew's quarters were cramped and poorly ventilated. Lingering heat from the boilers kept the interior at a stifling temperature, and the humidity was oppressive. To make matters worse, the Admiralty—in perpetuating the myth that the *K*-class submarines were self-contained, independent warships—required the crew to live aboard, even in port. These wretched living conditions, coupled with a growing reputation for crew lethality, made the *K*-class unpopular boats to serve in, and morale was a recurring problem.

Early War Experience

With Lord Fisher gone, the Admiralty authorized ten more *K*-class submarines in 1915 and then another seven the next year for a total of 21. Virtually all of these were ordered even before the earliest of the first batch, *K3*, was commissioned at the Vickers yard in August 1916.

K3's sea trials had been memorable. During speed runs, her Boiler and Turbine Rooms became so hot that the hatches had to be left open, and a head sea cracked the conning tower windows. On an early test dive, with Prince George—the future King George VI—aboard as an observer, the boat lost trim and burrowed into the muddy sea-bed with her propellers thrashing the air above. It took 20 minutes to back her out and return to the surface. Then, in January 1917, on one of her first war patrols from the Grand Fleet's main operating base at Scapa Flow in the Orkney Islands, she shipped a beam sea and took so much water down the funnels that her Boiler Room nearly filled up. Admiral Fisher's auxiliary diesel engine brought her back to port.

The second of the class to be completed, *K13*, began her career with a tragic accident. On 29 January 1917, during what was supposed to be the final test dive of her acceptance trials in Gareloch, one or more of the 37-inch Boiler Room ventilators failed to close, and the entire submarine abaft the midships Torpedo Room flooded. Emergency

procedures were unavailing, and *K13* settled to the bottom in 60 feet of water, with 49 survivors trapped forward and 31 dead aft. A tortuous 50-hour rescue operation, in which the bow of the submarine was lifted to the surface and an escape hole cut through the pressure hull, succeeded in extricating the living. The ensuing inquiry resulted in some superficial changes: more thorough procedures for shutting hull openings, better training, restricting the number of civilians allowed aboard (since seven had been lost on *K13*), and finally, decreeing that no future submarine would bear the unlucky number “13.” Accordingly, after *K13* was raised and refurbished, she was recommissioned in October 1917 as *K22*.

All 13 *K*-boats with sea trials in the first half of 1917 had serious problems. Fuel leaks, explosions, fires, boiler flashbacks, hydraulic failures, and groundings were common. During a static test dive at the Devonport Dockyard with many civilian workmen aboard, *K6* refused to surface. The occurrence was hushed up. *K14* sprang a leak at anchor in the Gareloch, flooded her batteries, and nearly asphyxiated the crew with chlorine gas. She had to be towed in. As more of the boats gradually moved north to join the Grand Fleet at Scapa Flow, their tactical deficiencies became increasingly apparent. Formed into two flotillas and employed primarily for antisubmarine sweeps of the North Sea in conjunction with light surface

forces, the *K*-class proved unwieldy and unreliable, several barely making it back to port after engineering mishaps. In one operation, after narrowly avoiding destruction by friendly destroyers mistaking her for a *U*-boat, *K7* earned the distinction of being the only *K*-class submarine ever to fire in anger when she attacked the German *U-95* on 16 June 1917. Firing five torpedoes, she scored one hit—and that was a dud. After a short surface chase, with *K7* gaining, *U-95* submerged and escaped.

After the Battle of Jutland in mid-1916, the German High Seas Fleet provided the British no real opportunity to execute the tactical concept for which the *Ks* had been designed. Nonetheless, Admiral Beatty, replacing Jellicoe as Commander-in-Chief, led several large-scale feints into the Heligoland Bight in late 1917, hoping to draw the Germans out. In one of these operations, in mid-November, the *K*-class 12th Submarine Flotilla took part in one of the rare instances when they were actually used as “fleet submarines.” Although they saw no action against the enemy, misfortune struck again. On the night of 17 November, *K4* collided with *K1* off the coast of Denmark, so crippling the latter attempts to tow her away were thwarted by worsening weather, and she had to be abandoned and sunk. Fortunately, there was no loss of life.

Disaster in the Firth of Forth

Sadly, this was not the case in a lugubrious incident that took place on the evening of 31 January 1918 off the Firth of Forth. By then, Beatty had moved the *K*-boats south of Rosyth, where they joined the Fifth Battle Squadron and the Second Battle Cruiser Squadron under Vice Adm. Hugh Evan-Thomas. Beatty planned a major fleet exercise for 1 February in which his main force from Scapa Flow would rendezvous with the Rosyth contingents in the North Sea. Thus, in the early evening of 31 January, Evan-Thomas, in the cruiser HMS *Courageous*, led his forces down the Firth of Forth in a long, single line-ahead. After *Courageous* came the 13th Submarine Flotilla—*K11*, *K17*, *K14*, *K12*, and *K22* (formerly *K13*)—all following their Commodore, Cmdr. Edward Leir, in the flotilla leader HMS *Ithurriel*. Several miles behind them were the battle cruisers *Australia*, *New Zealand*, *Indomitable*, and *Inflexible*, and then the 12th Submarine Flotilla: the light cruiser HMS *Fearless* (with Capt. Charles Little, Commodore), *K4*, *K3*,

K6, and *K7*. Bringing up the rear were three battleships, which, like the battle cruisers, were accompanied by a number of screening destroyers. The initial speed of advance was 16 knots, but Evan-Thomas had ordered his forces to increase speed to 22 knots when they passed May Island, which lay just at the entrance to the Forth estuary.

The night was clear and the seas relatively calm, but the moon had not yet come up, and each of the *K*-boats was essentially steering on the shrouded stern light of the vessel ahead.

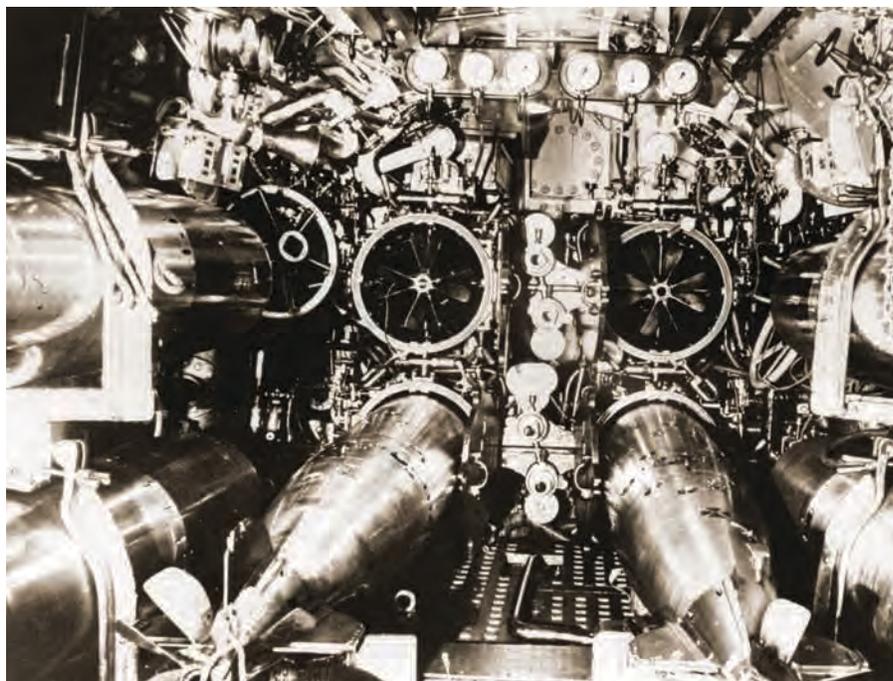
At approximately 1900, *Courageous* passed May Island and increased speed, just as a low-lying bank of mist settled over the sea. Almost simultaneously, Evan-Thomas’ force unexpectedly encountered a small flotilla of minesweeping trawlers crossing their path. As *K14* maneuvered to avoid them, her helm jammed, and she veered out of line to port and slowed. Meanwhile, *K22*, having lost sight of her next ahead, *K12*, had also straggled to port off the intended track, and when *K14* managed to regain steering and turned back to starboard, *K22* plowed into her at 19 knots, nearly tearing off her bow. Thus began a chain reaction of misadventures that was later dubbed the “Battle of May Island.”

With both *K22* and *K14* now dead in the water—and the latter nearly *in extremis*—out of the mist loomed the battle cruisers, with *Australia* in the van. The first three succeeded in avoiding the crippled submarines, but *Inflexible*, last in line, struck *K22* a glancing blow and tore

down her side making 18 knots, removing all her external tankage. Surprisingly, both submarines survived, and *K22* even made it back to port the next day under her own power.

By 2000, Commodore Leir on *Ithurriel* had received word of the initial collision, and turned back—with *K11*, *K17* and *K12* in train—to render assistance. Almost immediately, they ran afoul of the column of battle cruisers and their screening destroyers, still outbound, but narrowly managed to avoid a collision. With that danger averted, however, Leir blundered right across the bows of the oncoming 12th Submarine Flotilla, with *Fearless* in the lead, and the latter rammed full speed into *K17*, just forward of the conning tower. *Fearless* lost twenty feet of her bow, and *K17* sank within eight minutes. In the resulting confusion, *K6* collided with *K4*, nearly cutting her in half. *K4* sank almost immediately, but not before *K7* ran over her in turn. These events left the confused remnant of both submarine squadrons stationary in the path of the battleships and their destroyers at the end of the column. Just alerted to the catastrophe before arriving on the scene, all three battleships in succession barely squeezed by *K3*, but their accompanying destroyers killed many *K17* survivors in the water.

At dawn when the mist had lifted, the losses in the “Battle of May Island” were revealed: *K4* and *K17* sunk; *Fearless*, *K14*, and *K22* badly damaged; and over 100 men drowned. The resulting inquiry and a court-martial



View of HMS *K8* interior bow torpedo tubes.

Courtesy of The Royal Navy Submarine Museum, Gosport



Close up of HMS *K6* gun and funnels, looking aft.

assigned blame to five officers, but still no one questioned the tactical concept of operating the *K*-class boats with surface ships or the technical deficiencies of a submarine that combined the ‘speed of a destroyer, the turning circle of a battle cruiser, and the bridge-control facilities of a picket boat.’ Indeed, in June 1918, the Admiralty ordered six more, intended to be numbered *K23* through *K28*.

Big Guns on Submarines – The *M*-Class

Earlier, however, the Admiralty had decided to follow up on a post-retirement suggestion of Lord Fisher, who proposed arming large submarines with 12-inch guns to create a class of “submarine dreadnoughts” that would be more effective against surface ships than boats armed with torpedoes alone. Since these ships might also have been useful

for shore bombardment, they were eventually christened “submarine monitors.” The Director of Naval Construction produced a design in 1916 for a class of four such boats, which were laid down on the keels of *K18*, *K19*, *K20*, and *K21*, all just starting construction. This was the *M*-class, and prudently, the Navy reverted to diesel engines for their surface propulsion. Each carried a single 12-inch gun in a large casing forward of the conning tower that could be fired from periscope depth with the muzzle protruding from the water. Though fifty rounds of ammunition were carried for the gun, it could only be reloaded on the surface.

Despite the engineering challenges of adapting a 60-ton battleship rifle to a submarine, the *M*-class boats were reasonably successful. They could make 15 knots above water—10 submerged—and because of their

great weight, could dive in 30 seconds and remain stable underwater. Even the gun was relatively trouble-free, although on one occasion *M1*’s hydraulically-operated tampion—what was supposed to seal the barrel—allowed water to leak in ahead of the shell. When the gun was fired, the projectile tore off the muzzle, which flew away with the wire winding of the barrel trailing behind, like a giant fly-cast. *M1* was only readied for action in June 1918 and was sent to the Mediterranean, where she never fired a shot in anger. *M2* and *M3* were commissioned in 1919 and 1920, respectively, but *M4* was cancelled on the stocks at war’s end.

The *K*- and *M*-Classes Post-War – The Beat Goes On

By the time World War I ground to a halt in November 1918, and particularly in the aftermath of the “Battle of May Island,” the reputation of the *K*-class had sunk so low that the Royal Navy was having difficulty finding submariners—all volunteers—willing to serve in them. Consequently, the Naval Society issued a lengthy treatise minimizing their many deficiencies and defending their performance in the war. The Admiralty’s 1921 *Technical History and Index* noted that, “The *K*-class stands by itself. No other nation is building similar boats and our inception of them shows that our lead in design is very great.”¹ Nonetheless, the Navy cancelled five of the six *K*-class boats ordered in 1918 when hostilities ceased; only *K26* was commissioned, in May 1923. Incorporating a number of improvements in her boilers, funnels, air intakes, and ballast tanks, she was expected to become the first of a new class of replacements, but in fact, no more were ever built. Moreover, even before trials, she upheld the traditions of the *K*-class by scalding two men to death in a boiler accident.

Even after the Armistice, the *K*-class submarines continued their erratic behavior, and several more nearly foundered. When Admiral Sir David Beatty was appointed First Sea Lord in 1919, however, their prospects improved. Since Beatty remained a firm believer in “submersible battle cruisers” and fleet submarines, he formed seven of the remaining *K*-class boats into the Atlantic Fleet’s 1st Submarine Flotilla, specifically to gain deep water fleet experience. In 1920, they accompanied the Atlantic Fleet on a lengthy overseas cruise to Arosa Bay (Spain), Gibraltar, Majorca, and Algiers, and although several suffered the usual and by-now familiar engineering and

seakeeping problems, they all returned without mishap. On 20 January 1921, however, *K5* disappeared with all hands during fleet exercises 120 miles west-southwest of the Scilly Islands, probably the victim of a loss of control in a dive. Except for an oil slick and some wood fragments, she was never found. Only six months later, *K15* sank at her pier in Portsmouth, and although raised, she did not return to service and was eventually scrapped.

As more of the older *K*-class were retired during the 1920s, *M1*, *M2*, and *M3* took their places in the 1st Submarine Flotilla, along with the newly-commissioned *K26*. Then on 12 November 1925, *M1* disappeared while on a routine training exercise only 15 miles south of Start Point on the southeast coast of England. Her whereabouts remained a mystery for the ten days it took the Swedish freighter *Vidar* to arrive at Kiel and report striking a submerged object precisely when and where *M1* had gone missing. Paint scrapings on *Vidar*'s hull revealed that the submerged object had indeed been the lost submarine. After this tragedy, the Royal Navy disbanded the 1st Submarine Flotilla, and all of the remaining *K*-boats, save *K26*, were disposed of. *K26* spent most of the rest of her days in the Mediterranean, but she too

went to the breakers in 1931, as troublesome as her sisters to the very end.

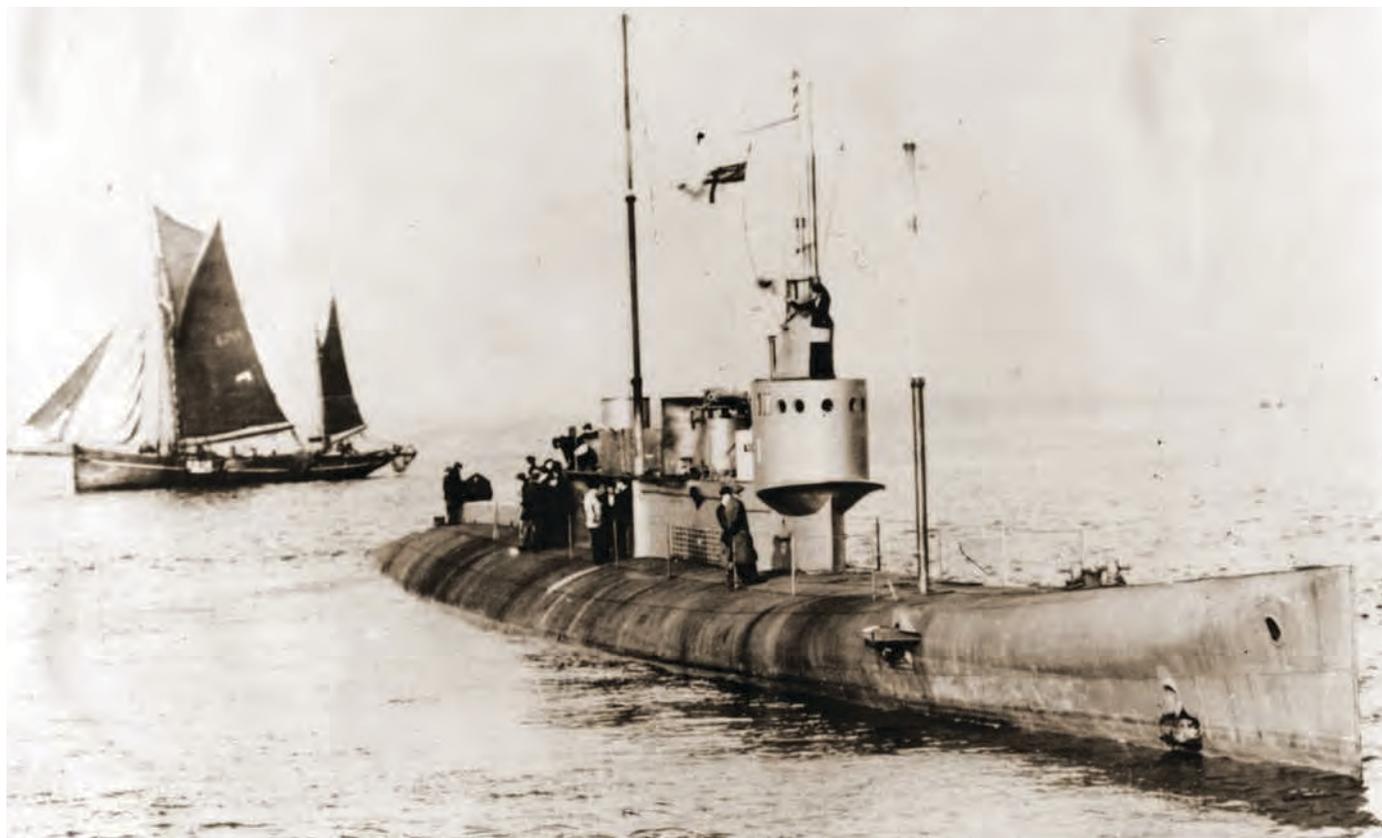
This left only *M2* and *M3*—originally *K19* and *K20*—to carry on the fateful tradition. After the loss of *M1*, the gun on *M2* was removed and its housing converted into an airplane hangar to carry a collapsible Parnall Peto seaplane, which could be catapulted from the forecastle for scouting in advance of the fleet. Similarly, in 1927, *M3* was converted into a large submersible minelayer, with capacity for over a hundred mines. The Navy used both boats in the late 1920s and early 1930s for a variety of operational experiments, but on 26 January 1932, *M2* disappeared off Portland Bill with 60 men aboard. When her wreck was found on the bottom a week later, both the hangar door and the conning tower hatch were open, suggesting that the ship had flooded in the act of surfacing and attempting to launch the aircraft as quickly as possible. *M3*—happily—escaped the *K*-class nemesis, and she was scrapped that same year, thus bringing our sorry tale to a close. Of the 22 *K*- and *M*-class boats ultimately commissioned, only one saw combat. But seven—nearly a third—were lost to accidents, half with all hands.

The Lessons of History

What lessons can be learned from the sad history of the Royal Navy's *K*-class submarines? There are many—and each observer will discover his own. For some, it will be the danger of trusting in immature technologies; for others, the folly of overreacting to a perceived threat, or jumping to the conclusion of a flawed tactical concept. Subsuming all of these, however—and lying behind the Admiralty's stubborn persistence in defending their creation—was a "willing suspension of disbelief" that sacrificed common sense to an idealized view of naval operations that had little counterpart in the real world. Obvious design implications were not followed through to conclusion; the hard realities of recurring experience were ignored; and the habits of self-deception and wishful thinking drove out critical analysis and reflection. Are navies today very much different?

Edward C. Whitman, Ph.D. is the Naval Science Advisor at the Center for Security Strategies and Operations (CSSO) at Technatics, and is a former Senior Editor of *UNDERSEA WARFARE* magazine.

¹Don Everitt, *K Boats: Steam Powered Submarines in World War I* (Annapolis: Naval Institute Press, 1999).



HMS *K3* underway in harbor with sailing barge in background.

Submarine History on Postage Stamps

Over the past 75 years, 99 countries have issued a total of 460 submarine stamps depicting everything from naval submarines to deep-sea research vessels and Jules Verne's fictional *Nautilus*. Some of those stamps have interesting stories to tell, as the following examples show.

The First Submarine Stamp

The first country to issue a submarine stamp had no submarines in service, although it did have one boat on order from the Italian Naval Shipyard at Fiume (now Rijeka, Croatia). On Oct. 14, 1936, Romania issued a stamp on the occasion of its first naval exhibition (Prima Expoziție Marinarească) showing a submarine identified as *Delfinul* (*Dolphin*) operating in rough seas.

The picture was actually from *Delfinul*'s sea trails, and she was still fitting out when the stamp was issued. Although the submarine had been laid down in June 1927, disputes between the shipyard and the Romanian government delayed her construction, and she would not be commissioned into the Romanian fleet until 1938.

When Romania joined Germany in declaring war on the Soviet Union in June of 1941, *Delfinul* was still the country's only submarine—compared to more than 40 in the much larger Soviet Black Sea Fleet. Nevertheless, she completed nine war patrols before being laid up to repair depth charge



The world's first submarine stamp.

damage, and her mere existence presumably forced the Soviets to devote more resources to protecting convoys and the approaches to naval bases. The victorious Soviets seized *Delfinul* in port in August of 1944, eventually returning her so heavily damaged that she never went to sea again.

The First Submarine Stamp Issued to Raise Money

It has become common for small countries to issue stamps honoring other countries' submarines in the hope of raising money from stamp collectors. However, the first country to issue stamps for this purpose had a sizable undersea fleet of its own.

When the Spanish Civil War broke out in 1936, Spain's Republican government kept the Nationalist rebels from seizing any of Spain's 12 submarines. Nevertheless, with German and Italian help, the Nationalists gradually wore down Republican forces both at sea and on land. In 1938, with the Republican government desperately short of funds, someone came up with idea of instituting a special submarine mail service called *Correo Submarino*, whose unique stamps could be sold as souvenirs.

The Nationalists had clamped a naval and air blockade on Minorca, the only Spanish Mediterranean island still in Republican hands. Submarine *C-4*, then operating between the Republican-held cities of Barcelona and Cartagena, was assigned to deliver the *Correo Submarino* to the Minorcan port of Mahon.

C-4 left Barcelona on the morning of Aug. 12, 1938 carrying souvenir postcards and postal covers (souvenir envelopes) plus a number of regular letters to Republican naval personnel at Mahon. All of the mail bore the new stamps, the postmark "Primer Correo Submarino Barcelona-Mahon" and the date 11/agosto/1938. Ironically, *C-4* carried the submarine mail to Minorca mostly on the surface, only submerging briefly to avoid enemy aircraft and patrol boats outside the port of Mahon. On the return voyage, she carried mail with the same postmark but dated 13/agosto/1938—even though she did not actually leave Mahon until after dark on Aug. 17.



One of six stamps in the *Correo Submarino* series. Although *C-4* was the only submarine that actually delivered *Correo Submarino*, she did not appear on the stamps, which depicted three other boats: *A-1*, *B-2*, and *D-1* shown here.

Unfortunately for the Republicans, the single voyage of the short-lived *Correo Submarino* raised little revenue. Not until long after the Spanish Republic finally collapsed in 1939 did these rare stamps finally begin to command high prices from collectors and postal history buffs. As for *C-4*, she was taken over by the victorious Nationalists and came to an ignominious end in 1946, when she was rammed by a destroyer during maneuvers and sank with the loss of all hands.

The First Stamp Honoring Submariners

It's not surprising that the first country to issue stamps specifically honoring its submarine service was Nazi Germany, which relied on the *U*-boats as its primary naval force.

One of Germany's most prolific *U*-boat skippers was Kapitänleutnant Erich Topp. Topp sank six ships as skipper of *U-57* and 30 more after taking command of *U-552*, known as the "Red Devil" boat for the devil

figures painted on her conning tower. One of his victims was USS *Reuben James* (DD 245), the first U.S. warship lost during WWII—torpedoed under debatable circumstances on Oct. 31, 1941, while America was still technically a non-belligerent.



This 1943 German stamp shows a Type VII *U*-boat like Erich Topp's *U-552*.

Nazi propaganda trumpeted the *U*-boats' victories and made successful skippers national heroes. When Germany decided to honor its *U*-boat men with a stamp, it naturally depicted a submarine commander at the periscope. Several sources identify the officer as Topp, but the stamp bears no inscription identifying either the scene or the man. There would have been no need. Germans had already heard a great deal about submarines, and many had no doubt seen photo or newsreel coverage of the popular *U*-boat ace.



This 1944 German stamp featured an officer generally believed to be *U*-boat ace Erich Topp.

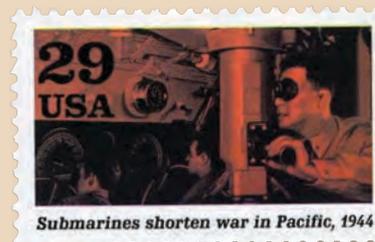
Ironically, the man who sank the *Reuben James* and was chosen to embody the ideal submariner on a Nazi postage stamp rejoined the German Navy a few years after the war, eventually rose to two-star rank, and rendered valuable service to the Free World during the Cold War. He even spent four years in the United States as a staff member of NATO's Military Committee.

Honoring America's World War II Silent Service

A greater irony is that it took the United States nearly half a century to issue the first U.S. postage stamp honoring our own World War II Submariners. Meanwhile, honoring the World War II Silent Service on postage stamps became a source of revenue for several small countries—appropriately including several Pacific island states that owed their liberation from Japan at least in part to the exploits of American Submariners.

Not until 1993 did the U.S. Postal Service finally honor America's World War II Submariners. The U.S. stamp resembled its German predecessor, but with one significant difference: It showed not only a skipper at the periscope, but also enlisted men at the controls. Because many Americans were unlikely to get the picture's point half a century after the events it symbolized, the stamp also explicitly credited U.S. Submarines with hastening the end of the war.

Not long thereafter, the U.S. Postal Service more than made up for lost time by hand-



The 1993 U.S. stamp depicting U.S. Submariners in 1944.

somely recognizing the centennial of the world's oldest Submarine Force. The 16-page prestige booklet it issued in 2000 featured two five-stamp souvenir sheets celebrating U.S. Submarines from the original USS *Holland* (SS 1) to today's *Ohio*-class, which for 30 years has served as the ultimate guarantor of America's freedom.

ETR2(SS) Dick Brown (ret.), a Submariner from 1961 to 1967, served on USS *Barbero* (SS 317) and USS *Lafayette* (SSBN 616). He is an avid submarine stamp collector and played a leading role in the effort to have SSN 779 named *New Mexico*, for his adopted state.



The 100th anniversary souvenir sheet.

Change of Command

COMSUBDEVGRU 5
 Capt. Jeffrey Jablon relieved
 Capt. Brian Howes

COMSUBRON 6
 Capt. Blake L. Converse relieved
 Capt. Eugene "Gene" E. Sievers

COMSUBRON 7
 Capt. Rick Stoner relieved
 Capt. James Pitts

COMSUBRON 11
 Capt. Thomas Ishee relieved
 Capt. Richard Correll

COMSUBDEVRON 12
 Capt. Vern Parks relieved
 Capt. William Merz

COMSUBRON 19
 Capt. Jerry Logan relieved
 Capt. Dennis Carpenter

COMSUBRON 20
 Capt. Christopher Harkins relieved
 Capt. Eric Holloway

Navy Submarine Base, Kings Bay
 Capt. Harvey Guffey relieved
 Capt. John O'Neill

Trident Refit Facility, Kings Bay
 Capt. Lawrence Hill relieved
 Capt. Richard Verbeke

Trident Training Facility, Kings Bay
 Capt. Rodney Hutton relieved
 Capt. Ronald Melampy

Undersea Rescue Command
 Cmdr. Andrew Kimsey relieved
 Cmdr. David Lemley

USS *Emory S. Land* (AS 39)
 Capt. Glenn W. Pendrick relieved
 Capt. Paul E. Savage

USS *Alabama* (SSBN 731) (B)
 Cmdr. Bradley Terry relieved
 Capt. Christopher Kline

USS *Alaska* (SSBN 732) (B)
 Cmdr. Todd Figanbaum relieved
 Cmdr. Kevin Byrne

USS *Annapolis* (SSN 760)
 Cmdr. Chester T. Parks relieved
 Cmdr. John Gearhart

USS *Asheville* (SSN 758)
 Cmdr. Doug Bradley relieved
 Cmdr. Gerald Miranda

USS *Charlotte* (SSN 766)
 Cmdr. Andrew T. Miller relieved
 Cmdr. Richard Young

USS *Cheyenne* (SSN 773)
 Cmdr. Noel J. Gonzalez relieved
 Cmdr. Gary A. Rogeness

USS *Columbia* (SSN 771)
 Cmdr. John Patrick Friedman relieved
 Capt. Dennis R. Boyer

USS *Florida* (SSGN 728) (B)
 Capt. Owen Travis relieved
 Capt. Gregory Ott

USS *Georgia* (SSGN 729) (G)
 Capt. Rhett Jaehn relieved
 Capt. Michael Cockey

USS *Hampton* (SSN 767)
 Cmdr. Lincoln Reifsteck relieved
 Cmdr. David Lott

USS *Helena* (SSN 725)
 Cmdr. Jeff Lamphear relieved
 Cmdr. Paul Dinius

USS *Louisiana* (SSBN 743) (G)
 Cmdr. Robert Peters relieved
 Cmdr. Joseph Turk

USS *Louisville* (SSN 724)
 Cmdr. Robert D. Figgs relieved
 Cmdr. Lee P. Sisco

USS *Maine* (SSBN 741) (B)
 Cmdr. William E. Johnson relieved
 Cmdr. Mark W. Schmall

USS *Maryland* (SSBN 738)
 Cmdr. Gregory Kercher relieved
 Cmdr. Andrew Kimsey

USS *Pennsylvania* (SSBN 735) (G)
 Cmdr. G. Tiger L. Pittman relieved
 Cmdr. Gustavo Gutierrez

USS *Pittsburgh* (SSN 720)
 Cmdr. Michael P. Ward II relieved
 Cmdr. Michael K. Savageaux

USS *Santa Fe* (SSN 763)
 Cmdr. David Adams relieved
 Cmdr. Timothy Poe

Lt. Bradley C. Bozin
 COMSUBRON 16

Lt. Frederick Calalang
 COMSUBRON 7

Lt. Joseph Campbell
 COMSUBRON 17

Lt. Andrew P. Caprari
 USS *Scranton* (SSN 756)

Lt. Cmdr. Michael Charnota
 COMSUBRON 11

Lt. Cmdr. Scott A. Charnik
 Naval Nuclear Power Training Unit

Lt. Cmdr. Kirk R. Dodson
 USS *Dallas* (SSN 700)

Lt. Javier Figueroa
 COMSUBRON 1

Lt. Cmdr. Benjamin Grant
 COMSUBRON 17

Lt. Cmdr. James Grant
 USS *Oklahoma City* (SSN 723)

Lt. Eric D. Hicks
 Naval Mine and ASW Command
 Detachment

Lt. Matthew G. Horton
 U.S. Fleet Forces Command

Lt. Andrew Kopacz
 COMSUBRON 11

Lt. Cmdr. Charles Litton
 COMSUBRON 17

Lt. Randolph Reed
 COMSUBRON 15

Lt. James S. Sharrow III
 COMSUBRON 6

Lt. Matthew Thatcher
 COMSUBRON 7

Lt. Cmdr. Jarrod Trant
 COMSUBRON 15

Lt. Robert Walls
 COMSUBRON 17

Lt. Sean Welch
 COMSUBRON 1

Lt. Kyle Welshans
 COMSUBRON 11



Photo by Mass Communication Specialist 1st Class Peter D. Lawlor

Adm. John Richardson shakes hands with Adm. Kirkland Donald after relieving him as the Director of Naval Reactors at a change of command ceremony.

Adm. John M. Richardson Assumes Duties as Director, Naval Nuclear Propulsion Program

On November 2, 2012, Adm. John M. Richardson relieved Adm. Kirkland H. Donald as Director, Naval Nuclear Propulsion Program in a ceremony attended by several hundred distinguished guests at the Washington Navy Yard. The Director is appointed for a term of eight years and is responsible for oversight of development and operations of all Naval nuclear reactors. Adm. Richardson, a submariner and 1982 graduate of the U.S. Naval Academy, is the sixth Director of Naval Reactors.

Arco (ARDM 5)
 Lt. Cmdr. Michael Thompson relieved
 Lt. Cmdr. Mack Schmidt

Qualified for Command

Lt. Cmdr. Mark B. Allen
 USS *Dallas* (SSN 700)

Lt. Cmdr. Kenneth A. Bourassa
 U.S. Fleet Forces Command

Qualified Nuclear Engineer Officer

Lt. j.g. Vivek Ahuja
 USS *Michigan* (SSGN 727) (B)

Lt. j.g. Andre Barber
 USS *Charlotte* (SSN 766)

Lt. j.g. James Barfoot
 USS *Columbia* (SSN 771)

- Lt. j.g. Peter Bleday
USS *Chicago* (SSN 721)
- Lt. j.g. Matthew Boehm
USS *Connecticut* (SSN 22)
- Lt. Jason Brethauer
USS *Maine* (SSBN 741) (B)
- Lt. j.g. David Brewer
USS *Cheyenne* (SSN 773)
- Lt. j.g. Jeffrey Buenaventura
USS *City of Corpus Christi* (SSN 705)
- Lt. j.g. Levi Burks
USS *Hawaii* (SSN 776)
- Lt. j.g. Matthew Burmester
USS *Nebraska* (SSBN 739) (B)
- Lt. Francis Carnaby
USS *Michigan* (SSGN 727) (G)
- Lt. j.g. Matthew Cerro
USS *Seawolf* (SSN 21)
- Lt. j.g. Erik Chamberlin
USS *Kentucky* (SSBN 737) (B)
- Lt. j.g. Christian Colburn
USS *Olympia* (SSN 717)
- Lt. j.g. Brandon Comer
USS *Jefferson City* (SSN 759)
- Lt. j.g. Jeffery Corniello
USS *Texas* (SSN 775)
- Lt. j.g. Paul Cronk
USS *Houston* (SSN 713)
- Lt. Brian Davis
USS *Topeka* (SSN 754)
- Lt. j.g. Travis Dziubla
USS *La Jolla* (SSN 701)
- Lt. j.g. Richard Eggers
USS *City of Corpus Christi* (SSN 705)
- Lt. Stephen Emerson
USS *Houston* (SSN 713)
- Lt. j.g. Timothy Erickson
USS *Kentucky* (SSBN 737) (B)
- Lt. j.g. Jose Fernandez
USS *Hampton* (SSN 767)
- Lt. j.g. Gregory Foley
USS *Hampton* (SSN 767)
- Lt. j.g. Andrew Foor
USS *Bremerton* (SSN 698)
- Lt. j.g. Markus Franz
USS *Nebraska* (SSBN 739) (G)
- Lt. j.g. Frederick Friedewald
USS *Texas* (SSN 775)
- Lt. j.g. Stephen Glenn
USS *Greeneville* (SSN 772)
- Lt. j.g. Tristan Glodeck
USS *Louisiana* (SSBN 743) (B)



Entire Boomer Fleet Receives Meritorious Unit Commendation

On July 20, 2012, Chief of Naval Operations Adm. Jonathan Greenert awarded the Meritorious Unit Commendation to the ballistic-missile submarine (SSBN) force. This commendation, a unit award equivalent to the Bronze Star, recognizes the boomer fleet's excellence in deterrence between July 16, 2007 and January 28, 2010. Award ceremonies were held in Bangor, Wash. and Kings Bay, Ga., the homeports of the ballistic-missile submarines in Pacific Task Force 134 and Atlantic Task Force 144. These ceremonies took place on the 52nd anniversary of the Navy's first submerged ballistic-missile launch, made by USS *George Washington* (SSBN 598) in July 1960.

Task Force 134 is comprised of eight SSBNs – USS *Henry M. Jackson* (SSBN 730), USS *Alabama* (SSBN 731), USS *Nevada* (SSBN 733), USS *Pennsylvania* (SSBN 735), USS *Kentucky* (SSBN 737), USS *Nebraska* (SSBN 739), USS *Maine* (SSBN 741), and USS *Louisiana* (SSBN 743). Additionally, it includes Submarine Group 9, Submarine Squadron 17, and Naval Submarine Support Center Bangor.

Task Force 144 is comprised of six SSBNs – USS *Alaska* (SSBN 732), USS *Tennessee* (SSBN 734), USS *West Virginia* (SSBN 736), USS *Maryland* (SSBN 738), USS *Rhode Island* (SSBN 740), USS *Wyoming* (SSBN 742), as well as Submarine Group 10, Submarine Squadron 20, and Naval Submarine Support Center Kings Bay.

Lt. Andrew Gordon USS <i>Alabama</i> (SSBN 731) (B)	Lt. j.g. Christopher Hermeling USS <i>Pennsylvania</i> (SSBN 735) (B)	Lt. Christopher Jessel USS <i>Cheyenne</i> (SSN 773)
Lt. j.g. Stephen Graham USS <i>Columbia</i> (SSN 771)	Lt. j.g. Scott Hodgson USS <i>Louisiana</i> (SSBN 743) (G)	Lt. James Kaufman USS <i>Maine</i> (SSBN 741) (B)
Lt. j.g. James Grasmeder USS <i>Oklahoma City</i> (SSN 723)	Lt. j.g. Mark Horodowicz USS <i>Buffalo</i> (SSN 715)	Lt. Thomas Kelly USS <i>Louisiana</i> (SSBN 743) (B)
Lt. j.g. Christopher Gray USS <i>Jimmy Carter</i> (SSN 23)	Lt. j.g. Joshua Hricik USS <i>Ohio</i> (SSGN 726) (G)	Lt. j.g. Brandon Kent USS <i>North Carolina</i> (SSN 777)
Lt. j.g. Nicholas Hamilton USS <i>Charlotte</i> (SSN 766)	Lt. Juan Huizar USS <i>Asheville</i> (SSN 758)	Lt. j.g. John Kha USS <i>Santa Fe</i> (SSN 763)
Lt. j.g. Tristen Hannah USS <i>Louisiana</i> (SSBN 743) (G)	Lt. Christopher Jack USS <i>Houston</i> (SSN 713)	Lt. Eric Kiewel USS <i>Louisiana</i> (SSBN 743) (G)
Lt. j.g. Richard Heidel USS <i>City of Corpus Christi</i> (SSN 705)	Lt. j.g. Harish Jairam USS <i>Buffalo</i> (SSN 715)	Lt. j.g. Travis King USS <i>Michigan</i> (SSGN 727) (B)

Lt. Paul Koski
USS *Jefferson City* (SSN 759)

Lt. j.g. Tony Le
USS *Santa Fe* (SSN 763)

Lt. j.g. Ryan Loomis
USS *Columbia* (SSN 771)

Lt. j.g. Joseph Mabis
USS *San Francisco* (SSN 711)

Lt. Douglas McKenzie
USS *North Carolina* (SSN 777)

Lt. Joshua Meek
USS *San Francisco* (SSN 711)

Lt. Joshua Merdes
USS *Columbus* (SSN 771)

Lt. j.g. Christopher Middleton
USS *Henry M. Jackson* (SSBN 730) (B)

Lt. j.g. David Miller
USS *Oklahoma City* (SSN 723)

Lt. j.g. Stephen Molnar
USS *Chicago* (SSN 721)

Lt. j.g. Matthew Mosher
USS *Columbus* (SSN 762)

Lt. j.g. Justin Murty
USS *Nebraska* (SSBN 739) (G)

Lt. Anthony Nebel
USS *Seawolf* (SSN 21)

Lt. j.g. Nicholas Rausa
USS *Albuquerque* (SSN 706)

Lt. Chad Rawlings
USS *Bremerton* (SSN 698)

Lt. j.g. Joshua Rehak
USS *Jacksonville* (SSN 699)

Lt. j.g. Dominic Rinaldi
USS *La Jolla* (SSN 701)

Lt. j.g. Brian Rodgers
USS *North Carolina* (SSN 777)

Lt. j.g. Robert Samples
USS *Jacksonville* (SSN 699)

Lt. Alexander Sayers
USS *Louisville* (SSN 724)

Lt. j.g. Gregory Schmidt
USS *Kentucky* (SSBN 737) (B)

Lt. j.g. Paul Schreiner
USS *Ohio* (SSGN 726) (B)

Lt. j.g. Kyle Scribner
USS *Maine* (SSBN 741) (G)

Lt. j.g. William Seaman
USS *Key West* (SSN 722)

Lt. j.g. Michael Seipp
USS *Kentucky* (SSBN 737) (B)

Lt. j.g. Andrew Shafer
USS *Columbus* (SSN 762)

Lt. j.g. Matthew Snyder
USS *Pennsylvania* (SSBN 735) (G)

Lt. j.g. Shawn Stolsig
USS *Maine* (SSBN 741) (G)

Lt. j.g. Patrick Stone
USS *Michigan* (SSGN 727) (G)

Lt. j.g. Ryan Sudlow
USS *Henry M. Jackson* (SSBN 730) (G)

Lt. j.g. Brian Sullivan
USS *Kentucky* (SSBN 737) (B)

Lt. j.g. Adam Swett
USS *Seawolf* (SSN 21)

Lt. Nicholas Takeuchi
USS *Nebraska* (SSBN 739) (B)

Lt. j.g. Heriberto Tomasz
USS *Henry M. Jackson* (SSBN 730) (B)

Lt. j.g. Matthew Wadden
USS *Ohio* (SSGN 726) (G)

Lt. Joseph Westfall
USS *Maine* (SSBN 741) (B)

Lt. j.g. Christopher Whitley
USS *Alabama* (SSBN 731) (B)

Line Officer Qualified in Submarines

Lt. Erik A. Adams
USS *Maryland* (SSBN 738) (B)

Lt. j.g. Jason A. Aepli
USS *Boise* (SSN 764)

Lt. j.g. Jafar A. Ali
USS *New Hampshire* (SSN 778)

Lt. j.g. Nathaniel Backstrom
USS *La Jolla* (SSN 701)

Lt. j.g. Luke Barousse
USS *Jimmy Carter* (SSN 23)

Lt. j.g. Jared Bayne
USS *Tucson* (SSN 770)

Lt. j.g. Jeremy Bennet
USS *Nevada* (SSBN 733) (B)

Lt. j.g. Steven B. Blackmon
USS *Pasadena* (SSN 752)

Lt. j.g. Ryan D. Blankenship
USS *Montpelier* (SSN 765)

Lt. j.g. Richard L. Bowie
USS *West Virginia* (SSBN 736)

Lt. Matthew J. Campbell
USS *Norfolk* (SSN 714)

Lt. j.g. Robert Carelli
USS *City of Corpus Christi* (SSN 705)

Lt. j.g. Joshua Castaneda
USS *San Francisco* (SSN 711)

Lt. j.g. Joseph Cerezo
USS *City of Corpus Christi* (SSN 705)

Lt. j.g. Andrew C. Chaloupka
USS *Rhode Island* (SSBN 740) (B)

Lt. j.g. Steven S. Choi
USS *Miami* (SSN 755)

Lt. j.g. Nicholas Cichucki
USS *Chicago* (SSN 721)

Lt. j.g. Jarrett Crossgrove
USS *Topeka* (SSN 754)

Lt. j.g. Ryan Crowe
USS *Alabama* (SSBN 731) (G)

Lt. j.g. Brian J. Dahl
USS *Montpelier* (SSN 765)

Lt. j.g. Charles Daniel
USS *Hampton* (SSN 767)

Lt. Phillip E. Davis
USS *California* (SSN 781)

Lt. j.g. Leonard Deprisco
USS *Alabama* (SSBN 731) (G)

Lt. j.g. David J. Disanto
USS *Missouri* (SSN 780)

Lt. j.g. Nathaniel Doane
USS *Henry M. Jackson* (SSBN 730) (B)

Lt. j.g. Christopher Donnelly
USS *La Jolla* (SSN 701)

Lt. j.g. Alexander Duffy
USS *Bremerton* (SSN 698)

Lt. j.g. Sullivan Edwards
USS *Louisiana* (SSBN 737) (G)

Lt. j.g. David Edwms
USS *Oklahoma City* (SSN 723)

Lt. j.g. Timothy Erickson
USS *Kentucky* (SSBN 737)

Lt. Michael E. Eyler
USS *Norfolk* (SSN 714)

Lt. j.g. Daniel J. Faherty
USS *Scranton* (SSN 756)

Lt. j.g. Frank Ferrell
USS *Greenville* (SSN 772)

Lt. j.g. Richard A. Fraenkel
USS *Hartford* (SSN 768)

Lt. j.g. Matthew D. Freeze
USS *Miami* (SSN 755)

Lt. j.g. Joseph Goldfrank
USS *Ohio* (SSGN 726) (G)

Lt. j.g. James Grasmeyer
USS *Oklahoma City* (SSN 723)

Lt. j.g. Shawn M. Grogan
USS *Helena* (SSN 725)

Lt. j.g. Michael Gumpert
USS *Jacksonville* (SSN 699)

Lt. j.g. David E. Guthmann
USS *Newport News* (SSN 750)

Lt. j.g. Benjamin S. Hankin
USS *Miami* (SSN 755)

Lt. j.g. Justin Hare
USS *Hampton* (SSN 767)

Lt. j.g. Christopher J. Hart
USS *Albany* (SSN 753)

Lt. j.g. Michael E. Heatherly
USS *Helena* (SSN 725)

Lt. j.g. Christopher Hermeling
USS *Pennsylvania* (SSBN 735)

Lt. j.g. Clinton J. Hillman
USS *Rhode Island* (SSBN 740) (B)

Lt. j.g. Patrick Hooper
USS *Connecticut* (SSN 22)

Lt. j.g. Michael Hoselton
USS *Buffalo* (SSN 715)

Lt. j.g. Justin Hunnell
USS *Connecticut* (SSN 22)

COMSUBFOR Change of Command

On September 7, 2012, Vice Adm. Michael J. Connor relieved Adm. John M. Richardson as Commander, Submarine Forces/ Submarine Force Atlantic/ Allied Submarine Command in a ceremony aboard the *Virginia*-class attack submarine USS *New Mexico* (SSN 779). During his time as Commander, Submarine Forces, Adm. Richardson charged undersea leaders with developing a plan to better prepare the undersea forces for warfighting, a process which resulted in the Design for Undersea Warfare. Prior to his appointment as Commander, Submarine Forces, Vice Adm. Connor commanded USS *Seawolf* (SSN 21), Submarine Squadron Eight, and Submarine Group Seven. He most recently served as the Deputy Chief of Naval Operations for Warfare Systems.

2012 Stockdale Award Recipients

The Chief of Naval Operations presented the annual Vice Adm. James Bond Stockdale Award for Inspirational Leadership to Cmdr. Brian Sittlow and Cmdr. Chase Patrick in a ceremony at the Pentagon Hall of Heroes on Nov. 27, 2012. Cmdr. Sittlow, the Atlantic Fleet recipient, is the Commanding Officer of USS *Boise* (SSN 764); Cmdr. Patrick, the Pacific Fleet recipient, is the former CO of USS *Chafee* (DDG 90).



Photos by Mass Communication Specialist 1st Class Peter D. Lawlor

The Stockdale Award was established by the Navy in 1980 to honor Vice Adm. James Stockdale, a Medal Honor recipient who was held for eight years as a prisoner of war in North Vietnam. The award is presented annually to two commanding officers below the grade of captain who command operational units. The most important criteria is a judgment of the unit's overall excellence, with particular emphasis on the candidate's exemplifying the selected roles of leadership emphasized by Vice Adm. Stockdale in his writing: moralist, jurist, teacher, steward, and philosopher.

Lt. j.g. Phillip Johnson
USS *Kentucky* (SSBN 737)

Lt. j.g. Maverick Jubane
USS *Pennsylvania* (SSBN 735)

Lt. j.g. Alexander G. Kelley
USS *New Mexico* (SSN 779)

Lt. j.g. Brian Kirk
USS *Louisville* (SSN 724)

Lt. j.g. Gary D. Kisselback
USS *Montpelier* (SSN 765)

Lt. j.g. Karl Kjono
USS *Olympia* (SSN 717)

Lt. j.g. Eric M. Kronberg
USS *Newport News* (SSN 750)

Lt. Richard Kuss
USS *Kentucky* (SSBN 737)

Lt. j.g. Travis Lagnese
USS *San Francisco* (SSN 711)

Lt. j.g. Charles Laspe
USS *Alabama* (SSBN 731) (G)

Lt. j.g. Jeffrey P. Leshar
USS *Rhode Island* (SSBN 740) (B)

Lt. j.g. Luke C. Leveque
USS *Maryland* (SSBN 738) (B)

Lt. j.g. Matthew B. Macnak
USS *Alaska* (SSBN 732) (G)

Lt. j.g. Michael Marker
USS *Henry M. Jackson* (SSBN 730) (G)

Lt. j.g. Joseph L. Marsh IV
USS *Hartford* (SSN 768)

Lt. j.g. Matthew J. Marsh
USS *Miami* (SSN 755)

Lt. j.g. Jacob Mattox
USS *Pennsylvania* (SSBN 735)

Lt. j.g. Kyle E. McFadden
USS *Wyoming* (SSBN 742) (G)

Lt. j.g. Anthony Meyer
USS *Tucson* (SSN 770)

Lt. j.g. Daniel T. Miller
USS *Helena* (SSN 725)

Lt. j.g. David Miller
USS *Oklahoma City* (SSN 723)

Lt. j.g. Jonathon L. Miller
USS *Toledo* (SSN 769)

Lt. j.g. James B. Montgomery
USS *Newport News* (SSN 750)

Lt. j.g. Thomas Mulqueen
USS *Alabama* (SSBN 731) (B)

Lt. j.g. William Nemecek
USS *Jefferson City* (SSN 759)

Lt. j.g. Andrew Neuwirth
USS *Henry M. Jackson* (SSBN 730) (B)

Lt. j.g. John Oldenkamp
USS *Texas* (SSN 775)

Lt. j.g. William Olena
USS *Jefferson City* (SSN 759)

Lt. j.g. Justin Pace
USS *Tucson* (SSN 770)

Lt. j.g. Harrison Palmer
USS *Oklahoma City* (SSN 723)

Lt. j.g. William Parks
USS *Buffalo* (SSN 715)

Lt. j.g. Jonathan H. Parry
USS *Pasadena* (SSN 752)

Lt. j.g. Jerry Pittman
USS *Jefferson City* (SSN 759)

Lt. j.g. James M. Plumley
USS *Virginia* (SSN 774)

Lt. j.g. Andrew Post
USS *Jefferson City* (SSN 759)

Lt. j.g. Donald W. Redding
USS *Pittsburgh* (SSN 720)

Lt. j.g. Eric Regnier
USS *Olympia* (SSN 717)

Lt. j.g. Curtis W. Reinking
USS *Maryland* (SSBN 738) (B)

Lt. j.g. Jason Richesin
USS *Henry M. Jackson* (SSBN 730) (G)

Lt. j.g. Brian G. Rigez
USS *Boise* (SSN 764)

Lt. j.g. Robert L. Rockwell
USS *Pasadena* (SSN 752)

Lt. j.g. Seth Romo
USS *Michigan* (SSGN 727) (G)

Lt. j.g. Grant Rotunda
USS *Topeka* (SSN 754)

Lt. j.g. Robert D. Routley
USS *Virginia* (SSN 774)

Lt. j.g. Jesse Schrader
USS *Michigan* (SSGN 727) (B)

Lt. j.g. Steven D. Sideri Jr.
USS *Hartford* (SSN 768)

Lt. j.g. Christopher Slaughter
USS *Louisiana* (SSBN 743) (G)

Lt. j.g. Danny Slover II
USS *Ohio* (SSGN 726) (G)

Lt. j.g. Tucker Stachitas
USS *Jimmy Carter* (SSN 23)

Lt. j.g. Nathan Stempel
USS *Louisville* (SSN 724)

Lt. j.g. Eric A. Stinson
USS *Tennessee* (SSBN 734) (B)

Lt. j.g. Shane Stumvoll
USS *Ohio* (SSGN 726) (G)

Lt. j.g. Ryan Sudlow
USS *Henry M. Jackson* (SSBN 730) (G)

Lt. j.g. Brian Sullivan
USS *Kentucky* (SSBN 737)

Lt. j.g. Stephen Sweeney
USS *Michigan* (SSGN 727)

Lt. j.g. Gregory J. Syme
USS *Virginia* (SSN 774)

First Female Unrestricted Line Officers to Qualify in Submarines

On December 5, 2012, the first female unrestricted line officers to qualify in submarines were presented with their “dolphin” warfare insignia. Lt. j.g. Marquette Leveque, USS *Wyoming* (SSBN 742)(G); Lt. j.g. Amber Cowan, USS *Maine* (SSBN 741) (B); and Lt. j.g. Jennifer Noonan, USS *Maine* (SSBN 741)(B) are among the 24 female officers assigned to *Maine*, *Wyoming*, USS *Ohio* (SSGN 726), and USS *Georgia* (SSGN 729), including 17 unrestricted line officers and seven supply officers. All three of the newly-pinned submariners graduated from the Submarine Officer Basic Course in Groton, Conn. and the Naval Nuclear Power School at Charleston, S.C., and reported to their respective boats in November 2011.



Photo by Chief Mass Communication Specialist Almon Arredies



Photo by Mass Communication Specialist 1st Class James Kimber

Lt. j.g. Kyle Szatkowski
USS *Bremerton* (SSN 698)

Lt. j.g. Jorge Tellez
USS *Louisiana* (SSBN 743) (B)

Lt. j.g. Drew Thompson
USS *Henry M. Jackson* (SSBN 730) (G)

Lt. Jeriahmi L. Tinsley
USS *Alaska* (SSBN 732) (B)

Lt. j.g. Heriberto Tomasz
USS *Henry M. Jackson* (SSBN 730) (B)

Lt. j.g. Jeremy Van Gelder
USS *Houston* (SSN 713)

Lt. Gerald E. Vineyard
USS *Virginia* (SSN 774)

Ensign Ian Waters
USS *Asheville* (SSN 758)

Lt. j.g. Bryan Watson
USS *Louisville* (SSN 724)

Lt. j.g. Andrew R. Weiner
USS *Maryland* (SSBN 738) (B)

Supply Officer Qualified in Submarines

Lt. Brady Beauchamp
USS *Jimmy Carter* (SSN 23)

Lt. j.g. Eduardo Castellanos
USS *City of Corpus Christi* (SSN 705)

Lt. j.g. Carlisle Catacutan
USS *Santa Fe* (SSN 763)

Lt. Britta Christianson
USS *Ohio* (SSGN 726) (G)

Lt. j.g. Emmett Delateur
USS *Henry M. Jackson* (SSBN 730) (G)

Lt. Rebecca Dremann
USS *Maine* (SSBN 741) (B)

Lt. Joshua S. Fischer
USS *Maryland* (SSBN 738) (B)

Lt. Melissa Gonzales
USS *Maine* (SSBN 741) (G)

Lt. j.g. Blake Harpel
USS *Alabama* (SSBN 731) (B)

Lt. j.g. Ian Henry
USS *Jefferson City* (SSN 759)

Ensign Jonathan Herrick
USS *Columbia* (SSN 771)

Lt. j.g. Blake Lingad
USS *Seawolf* (SSN 21)

Lt. James McPeake
USS *Michigan* (SSGN 727)

Lt. j.g. Franklin D. Middlebrooks
USS *Tennessee* (SSBN 734) (G)

Ensign David A. Petersen
USS *Florida* (SSGN 728) (G)

Lt. j.g. Sammie D. Robinson
USS *Tennessee* (SSBN 734) (B)

Lt. j.g. Brandon Stewart
USS *Henry M. Jackson* (SSBN 730) (B)

Lt. j.g. Michael Wiesman
USS *Chicago* (SSN 721)

Qualified IUSS Officer

Cmdr. Sean Bartlett
NOPF Whidbey Island

Lt. Cmdr. Scott Dancer
NOPF Whidbey Island

CWO2 Eric Graves
NOPF Whidbey Island

Lt. Chris Haney
NOPF Whidbey Island

Lt. Cmdr. James Rankin
NOPF Whidbey Island

Lt. Christian Woodside
NOPF Whidbey Island

Qualified as Engineering Department Master Chief

EMC Dean Anton
USS *Tucson* (SSN 770)

MMC Ronald J. Kielbasa
COMSUBDEVRON 5

MMC Jonathan L. Andrews
COMSUBRON 6

ETC Ivan R. Tirona
SLC Groton, CT

ETC Steven J. Ralph
USS *Dallas* (SSN 700)

MMC John P. Russo Jr.
USS *Pasadena* (SSN 752)

MMC Benjamin A. Woellert
SMMS PMT N L

EMC Richard M. Holtmeyer
USS *Miami* (SSN 755)

ETCS Anthony R. Liss
COMSUBRON 4

EMCS Johnny V. Tierce
USS *Wyoming* (SSBN 742) (G)

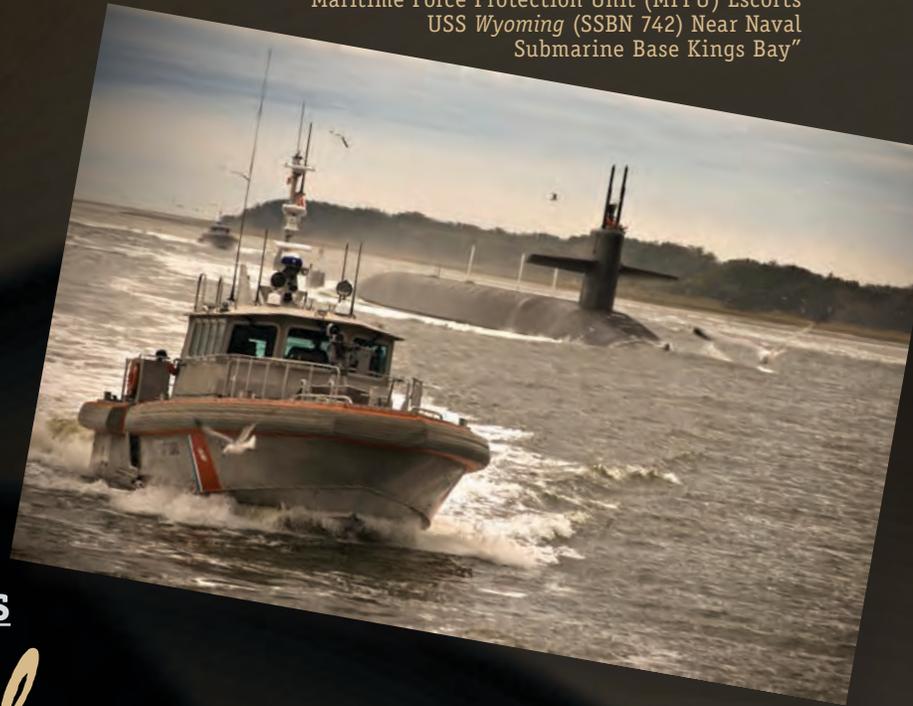


Third Place

Lt. Edward Early – “Royal Canadian Navy Submarine HMCS *Victoria* (SSK 876) in Bangor Magnetic Silencing Facility”

First Place

MC1 James Kimber – “USCG Security Vessel From Maritime Force Protection Unit (MFPU) Escorts USS *Wyoming* (SSBN 742) Near Naval Submarine Base Kings Bay”



Naval Submarine League’s

14th Annual Photo Contest Winners

Each year, the Naval Submarine League (NSL) and *UNDERSEA WARFARE* Magazine team up to sponsor a photo contest. We thank all those who participated in this year’s contest.



Second Place

Ms. Courtney Carullo – “USS *Greenville* (SSN 772) Returning to Homeport”



Honorable Mention

Mr. Mark Koopmans – “Pearl Harbor [Hi.] SSN and Sailboat”



Submarine Museums and Memorials



USS *Marlin* (SST 2) Memorial and Museum Omaha, Nebraska

Several decommissioned submarines are on display at museums and memorials across the United States. However, Freedom Park in Omaha, Nebraska can boast of one unique ship: the only target and training submarine left in the world, USS *Marlin* (SST 2) (formerly *T-2*).

Marlin is one of the smallest operational submarines ever built for the United States Navy, measuring 131 feet in length, drawing 12 feet, and displacing just 347 long tons submerged. *Marlin's* keel was laid on 1 May 1952 by the Electric Boat Division of the General Dynamics Corporation in Groton, Conn. She was launched on 14 October 1952, sponsored by Mrs. William R. DeLoach, and commissioned 20 November 1953 with Lt. Edward Holt in command.

Marlin conducted initial sea trials in the Massachusetts Bay before proceeding to her home port of Key West, Fla. There she provided target services for air and surface antisubmarine units of the Atlantic Fleet for nearly two decades, aiding in the development of tactics and equipment for both submarine and antisubmarine warfare. In addition to *Marlin's* contributions to antisubmarine warfare training, she also took part in mine

warfare exercises with her sister ship *T-1* (SST 1); *Amberjack* (SS 522), *Batfish* (SS 310), *Chivo* (SS 341); and Atlantic Fleet minecraft.

Marlin was deployed to Guantanamo Bay, Cuba for services to the Atlantic Fleet Training Group in July and August 1958, March 1960, and December 1961. Though the ship had a brief stint in Pascagoula, Miss. for refurbishing in 1969, from 1963 until her decommissioning she operated mainly as a target out of Key West, Fla.

After *Marlin's* decommissioning on 31 January 1973 at Naval Station, Key West, Fla. she was transferred to the Greater Omaha Military Historical Society of Omaha, Nebraska. On 25 August 1974, *Marlin* was dedicated at the opening of Freedom Park, where she can still be seen today. Located on the Missouri River just north of downtown Omaha, Freedom Park is an outdoor United States Naval Museum and park at the Greater Omaha Marina. In addition to *Marlin*, the park houses the minesweeper USS *Hazard* (AM 240), an Anchor and Propeller Garden, shipboard rocket launchers, and a Douglas A-4D Skyhawk attack aircraft.