

# 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

## Presence with a Purpose

U.S. Subs Prove Vital to the Navy's Fleet Response Plan

### INSIDE

PCU North Carolina  
Stands Up and Takes Charge

VADM Konezni Retires  
After 38 Years of Service

*Frigate Bird*: The Only  
End-to-End Test of a  
Strategic Nuclear Weapon

# UNDERSEAWARFARE

U.S. SUBMARINES... BECAUSE STEALTH MATTERS



# Presence with a Purpose

U.S. Subs Prove Vital to the Navy's Fleet Response Plan

## Features

- 2 Surge Protectors**  
Submarines Prove Vital to the Navy's Fleet Response Plan  
by JOC(SW/AW) David Rush, JOC(SW/AW) Mark Piggott,  
and J03 Steven Feller, USN
- 4 Submarine Force Says Goodbye to Big Al, The Sailor's Pal**  
by JOC Michael Foutch, USN
- 7 Simulator Brings Realistic Training to Sailors**  
by J01 Jennifer Spinner, USN
- 8 NUWC: Not Just Another "Reorg"**  
by CAPT John Mickey, USN
- 10 The Submarine Reserve**  
Dynamic Partners with the U.S. Fleet  
by LT Patrick R. Mallett, USNR
- 13 PCU North Carolina Crew Stands Up and Takes Charge**  
by JOSA Andrew Zask, USN
- 14 World's First Nuclear-Powered Submarine Celebrates 50 Years**  
by JOC Michael Foutch, USN
- 16 Eyes From the Deep**  
A History of U.S. Navy Submarine Periscopes  
by Thomas Holian
- 20 USS Portsmouth Deactivates After 21 Years of Service**  
by J01 Andrea Leahy, USN
- 24 The Other Frigate Bird**  
by Edward C. Whitman

## Departments

- 1 Washington Watch**
- 29 Downlink**
- 31 Letters to the Editor**
- 32 Operational Depth**



**VADM Charles L. Munns**  
Commander, Naval Submarine Forces  
Commander, Submarine Force, U.S. Atlantic Fleet

**RADM Paul Sullivan**  
Deputy Commander, Naval Submarine Forces  
Commander, Submarine Force, U.S. Pacific Fleet

**RDML Joe Walsh**  
Director, Submarine Warfare

**CAPT Stephen Gabriele**  
Commander, Undersea Surveillance

**LCDR Jensin Sommer**  
COMNAVSUBFOR Public Affairs Officer

**CDR Kelly Merrell**  
COMSUBPAC Public Affairs Officer

**LCDR Scott Young**  
Military Editor

**JOC Michael Foutch**  
Military Editor

**John Whipple**  
Senior Editor

**Mike Smith**  
Managing Editor

**BlueWater Agency**  
Layout & Design

**Lakisha Ferebee**  
Web Design

### Charter

**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 ones 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

Send articles, photographs (min 300 dpi electronic), and feedback to:

Military Editor  
Undersea Warfare CNO  
2000 Navy Pentagon, Washington, DC 20350-2000  
E-Mail: [underseawarfare@navy.mil](mailto:underseawarfare@navy.mil)  
Phone: 703-614-9372 Fax: 703-604-7858

### Subscriptions for sale by the Superintendent of Documents,

P.O. Box 371954, Pittsburgh, PA 15250-7954  
or call (202) 512-1800 or fax (202) 512-2250.  
Annual cost: \$25 U.S.; \$35 Foreign

### Authorization

**UNDERSEA WARFARE** is published quarterly from appropriated funds by authority of the Chief of Naval Operations in accordance with NPPR P-35. The Secretary of the Navy has determined that this publication is necessary in the transaction of business required by law of the Department of the Navy. Use of funds for printing this publication has been approved by the Navy Publications and Printing Policy Committee. Reproductions are encouraged. Controlled circulation.

UNDERSEAWARFARE  
2003 CHINFO Merit Award



## On The Cover



Photo by PH1 David C. Lloyd

MM3 Seth Buehnerkemper looks for contacts while standing watch on the bridge of the Los Angeles-class attack submarine USS Toledo (SSN-769) while the Officer of the Deck (OOD), LTJG Daniel Cavanagh, uses a handheld GPS in addition to the submarine's portable commercial radar display. The crew used their 10-day port visit to Bahrain as a work period to perform a mid-deployment upkeep. To read more about Toledo, see the ShipsAtSea section on the inside back cover.



RDML Joseph A. Walsh, USN  
Director, Submarine Warfare

**“Several important milestones during this period have left the Silent Service in an even better position to combat the challenges of tomorrow.”**

The summer and fall of 2004 will go into the books as one of dynamic change and revitalization for not only the Submarine Force but the U.S. Navy as a whole.

This fall has been bittersweet as we said goodbye to two of our icons: ADM Skip Bowman and VADM Al Konetzni. ADM Bowman has retired after serving 38 years with distinction and leading our force for the last eight years as Director, Naval Nuclear Propulsion Program. ADM Kirk Donald, former Commander, Naval Submarine Forces, relieved ADM Bowman on 5 November, in a retirement and change of command ceremony in Washington, D.C. Also leaving our ranks is VADM Al Konetzni, a true legend of the Submarine Force if ever there was one, who retired after 38 years of distinguished service. In addition, on 15 October, VADM Chuck Munns relieved ADM Donald as Commander, Naval Submarine Forces.

Several important milestones during this period have left the Silent Service in an even better position to combat the challenges of tomorrow.

October saw the commissioning of USS *Virginia* (SSN-774), the first submarine designed to meet the threats of a post-Cold War world. Every bit the embodiment of the modern day adaptable warrior, *Virginia* is designed to take the fight to the threat and prowl the murky waters of the littorals delivering a range of warfighting capabilities no other ship can boast. This increased littoral mission agility will continue to add to the adaptability and reach of today's Submarine Force.

In the face of decreasing resources and growing global responsibilities, the CNO instituted the Fleet Response Plan in 2003 to increase the Navy's effectiveness in maintaining presence with purpose and projecting power from the sea. Under these auspices, SUMMER PULSE '04 demonstrated the Submarine Force's ability to surge combat power across the globe quickly for operations in multiple theaters with other U.S., allied, and coalition forces. You can learn more about this important exercise in our feature, "Surge Protectors".

Elsewhere in this issue you can read how the submarine reserve force, as with all of the Naval Reserve, has evolved and grown in importance. Today they work side by side with their active duty shipmates. The role of the reservist has been tested and strained since the events of September 11, proving that these Sailors are a vital part of the fleet and truly are "twice the citizen", as they are often described.

As this fall marks the 50th anniversary of *Nautilus*, who ushered in the modern age of the submarine, we look back to a pivotal time in the evolution of the nuclear age. *Frigate Bird*, one of a series of tests in 1962 known as Operation Dominic, holds the distinction of being the only end-to-end system test of a strategic nuclear missile – from launch to detonation – ever carried out by either side during the Cold War. And it just so happens that *Frigate Bird* was launched from a submarine, USS *Ethan Allen* (SSBN-608).

One of the enduring symbols of submarines for the general public will always be that of a commanding officer hunched over, face pressed against the eye piece, scanning the horizon for contacts through the periscope. Since their introduction in the mid-1800s, periscopes have gone from crude refracting devices to modern fiber optics and this issue of UNDERSEA WARFARE Magazine takes an interesting look at their evolution.

With an eye to the future, the Submarine Force is poised to extend its dominance of the world's deep waters and littorals as we take delivery of *Jimmy Carter*, the last of the *Seawolf*-class, this December. *Texas* and *Hawaii* are working to join the fleet in 2006, and will take their places in a long and superb lineage. On the horizon, *North Carolina* is more than 50 percent complete. She, along with the rest of the *Virginia*-class, will have revolutionary technology to conduct, among other things, covert special operations; covert intelligence, surveillance, reconnaissance and electronic warfare; because, as the cover of this magazine states, stealth truly does matter.

# SURGE PROTECTORS

## Submarines Prove Vital to the Navy's Fleet Response Plan

In the face of decreasing resources and growing global responsibilities, Chief of Naval Operations (CNO) ADM Vern Clark instituted the Fleet Response Plan (FRP) in 2003 to increase the Navy's effectiveness in maintaining presence with purpose and projecting power from the sea.

"I would rather muster two battle groups for three months and do something really significant internationally – or cooperate with partners in training and so forth – than just go over and hang out for six months without purpose," Clark told a *Navy Times* editorial board. "The position that I'm pushing is that we should be less interested in presence and more interested in presence with a purpose."

The basic goal of FRP is to keep the Navy ready to surge adequate forces at a moment's notice, without regard to fixed deployment times and intervals. This approach increases readiness and adds significant flexibility to the employment of Navy assets any time, anywhere. Under the FRP, the Navy can provide six Carrier Strike Groups (CSGs) in less than 30 days to support contingency operations around the globe, with two more CSGs ready in three months to reinforce or relieve the initial responders, to continue presence operations in other parts of the world, or to support military action in another crisis.

This concept was tested in Summer Pulse '04, the Navy's first exercise using the FRP. Beginning in June and continuing through August, Summer Pulse '04 exercised the full range of skills involved in deploying and employing CSGs simultaneously around the world. Summer Pulse '04 incorporated already-scheduled deployments, surge operations, joint and international exercises, and other forms of advanced at-sea training.

According to former VADM Kirk H. Donald, Commander Naval Submarine Forces, submarines provided a significant portion of the credible combat force that mustered during Summer Pulse '04, and they demonstrated the Submarine Force's ability to surge combat power across the globe quickly for operations in multiple theaters with other U.S., allied, and coalition forces. "Surge deployments in support of the Fleet Response Plan

and Summer Pulse '04 are historical demonstrations of the Navy's ability to provide combat power to meet any challenge efficiently," Donald said. "Every submariner and all those who support submarine operations are contributing to the Navy's combat force."

In today's operations, submarines are providing unique – and often critical – capabilities. "The ongoing global war on terrorism has required rethinking how naval forces, including submarines, prepare to deploy and are sustained during a protracted war," VADM Donald explained. "The role of the submarine force continues to expand," he continued. "We provide a unique capability to surge when and where we are needed, arrive on station early, observe the enemy covertly as long as necessary, deploy special operations forces, unmanned underwater vehicles and unmanned sensors, and conduct strike operations with unmatched speed,

responsiveness, accuracy, and lethality."

While supporting Summer Pulse '04, submarines also maintained their role in real world operations in several Areas of Responsibility. According to RADM Paul F. Sullivan, Commander Submarine Force, Pacific Fleet, submarines are key to implementing the FRP and remain essential to our ability to respond to contingencies and fight the Global War on Terrorism. "Submarines are a major contributor to both peacetime and wartime operations. Arguably, Commander Pacific Fleet's primary focus is on anti-submarine warfare, which is potentially a major concern in almost any real-world scenario. Pacific Fleet attack submarines are involved on a daily basis in operations that set the stage for any future conflict, and are likely to have a significant impact on the outcome of any contingencies based on that preparation," said RADM Sullivan.



MA1 James Farrar, assigned to Mobile Security Detachment 22 (MSD-22), provides security for Portsmouth as she sails through the Panama Canal.

Photo by PH1 David A. Levy

“At any given time, roughly eight out of 10 of the Navy’s submarines are able to respond to emergent fleet requirements. The increased surge readiness has already been exploited several times this year to fulfill vital Seventh Fleet operational commitments, including the surge deployments of USS *Columbia* (SSN-771), USS *Salt Lake City* (SSN-716), and USS *Honolulu* (SSN-718) – twice in *Honolulu’s* case,” RADM Sullivan added.

Sullivan noted that many of the 17 nuclear-powered attack submarines homeported in Pearl Harbor have proven instrumental to surge deployments. “The Pacific Submarine Force has fully implemented the FRP. The attack-submarine cycle is slightly different from the aircraft-carrier cycle because of different maintenance requirements, but it satisfies all of the FRP readiness goals. Our Inter-Deployment Training Cycle (IDTC) instruction has recently been revised as a Fleet Readiness Training Program (FRTTP) instruction that fully implements the FRP,” said Sullivan.

In addition to the attack submarines home ported in Hawaii, two attack submarines, USS *San Francisco* (SSN-711) and USS *City of Corpus Christi* (SSN-705) are stationed in Guam under Submarine Squadron 15 and are an integral part of the total Pacific Submarine Force, providing added flexibility to the FRP and meeting surge requirements placed upon the Navy’s heavily-tasked assets.

To demonstrate the concept of surge readiness in the Atlantic, 10 submarines were deployed to four AORs, including USS *Albuquerque* (SSN-706) and USS *Miami* (SSN-755), which both deployed during several phases. *Miami* recently returned from a six-month deployment, where the submarine supported the USS *Enterprise* (CVN-65) CSG in operations in the Arabian Sea. Then, four months later, *Miami* surged again to support the *Enterprise* CSG during Summer Pulse ’04.

*Albuquerque* was two months into their Pre-Overseas Movement (POM) process in preparation for a deployment in the fall when the surge order came. *Albuquerque*, along with *Miami* and USS *Albany* (SSN-753), participated in Operation MEDSHARK/Majestic Eagle, a joint maritime exercise with ten allied nations to develop interoperability among multinational forces and address critical undersea warfare objectives in the European AOR.

“We did submarine warfare against nuclear and diesel submarines,” said CDR Joe Wiegand, *Miami’s* commanding officer. “We did surface warfare against ASW-capable units, and we were able to do ISR (Intelligence, Surveillance, and Reconnaissance) along the coastline and pass information along to our task group.”

With the participation of submarines from France, Italy, and Portugal, and undersea warfare forces from other coalition and allied forces, these exercises provided a

tactical forum for developing active-sonar tactics against quiet diesel boats.

“It takes all the assets in a Carrier Strike Group – the cruisers, destroyers, submarines, and logistic support ships that complement the carrier and its embarked air wing – working together seamlessly to truly implement a concept like the Fleet Response Plan,” said RADM Michael C. Tracy, Commander, Cruiser Destroyer Group Two. “This was demonstrated during Summer Pulse ’04,” he continued, “when the *Harry S. Truman* (CVN-75) Strike Group carried out multiple roles and missions and exercised the operational concepts of the Sea Power 21 strategy, while working alongside nine other nations during exercise Majestic Eagle. Each of the assets in the *Truman* Strike Group is integral and essential to the Strike Group team, and all performed superbly during both the COMPTUEX and Majestic Eagle exercises. This demonstrates that our team is really ready to surge.”

“I think the FRP worked fine from a Submarine Force perspective,” said *Albuquerque’s* commanding officer, CDR Stuart B. Munsch. “We’re usually ready at any time when they call on us, and this was a good illustration of the number of boats that are able to get up and go.”

Both Pacific and Atlantic Fleet submarines have shown that they are able to respond to FRP requirements. According to VADM Michael McCabe, Commander U.S. Third Fleet, the ability to return from a deployment, make necessary repairs, and be ready immediately to go back into harm’s way is something of which the Navy, and in particular, attack submarines, are very capable. “We’ve tightened up our whole approach to the rotation of equipment and personnel and training,” VADM McCabe said. “This will be both more efficient from the financial standpoint and more responsive from the deployability point of view. It will offer the leadership of the country – from the president on down – new opportunities to have forces available to them more rapidly.”

JOC(SW/AW) David Rush serves in the Public Affairs Office for Commander, Submarine Forces Pacific; JOC(SW/AW) Mark Piggott serves in the Public Affairs Office for Commander, Submarine Forces Atlantic; and J03 Steven Feller serves in the Public Affairs Office for Commander, Navy Region Northeast.





## Submarine Force Says Goodbye to *“Big Al, the Sailor’s Pal”*

**F**or 38 years, there was the voice. Sometimes booming, sometimes almost whispering, cajoling the person on the other end of the conversation to see things his way. The voice was a unique, passionate advocate for submarine programs, and the Sailors that took submarines to sea.

In a submarine community characterized by modulated, flattened accents and even-tempered tone, the voice cut though like a foghorn, redolent of 1950s Tony Curtis movies, cigar smoke, and his native Queens, where there were Noo Yawkizz rooting for the lamented Dodgizz.

The voice was the biggest weapon of “Big Al, the Sailor’s Pal.” And if you were up against that voice, arguing with VADM Al Konetzni – well, in the end you might feel like the mug, leaving the table with empty pockets, but with a little smile and a pat on the back, defeated by the best. But if you were a beaten-down Sailor thinking about giving up on the Navy, this admiral spared no personal effort, including breaking some Navy traditions, to help you stay in the service.

Because that was what he believed was right.

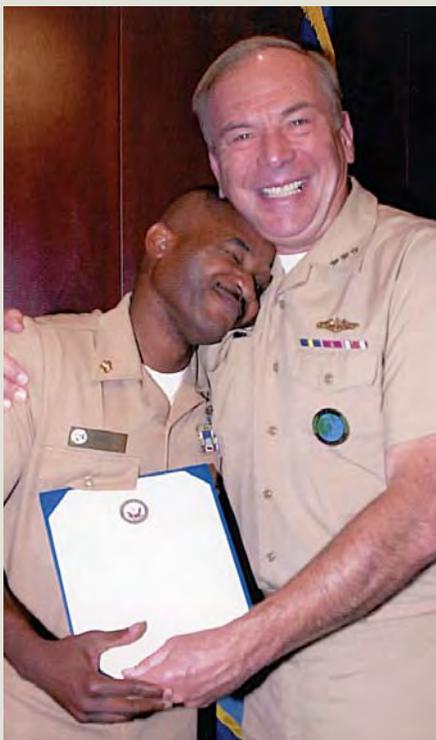
VADM Konetzni, the deputy commander of U.S. Fleet Forces Command and the U.S. Atlantic Fleet, retired on 17 July surrounded by hundreds of shipmates in a ceremony on the submarine piers in Norfolk. The location was appropriate considering that's where that voice did its best work.

His voice betrayed where this gregarious officer came from, a neighborhood where the heady brew of ethnic groups and jumbled backgrounds would prepare him for future leadership in a diverse Navy. You get the feeling after talking to this big fellow that while he never was the last guy picked for a ballgame, he made sure that that last guy *got* picked.

But the enduring concern for the junior Sailor that made him a name in the submarine fleet from Pearl Harbor to Norfolk didn't come from that Queens neighborhood. Shortly after graduating high school in suburban White Plains in 1962, he was in a hot mess hall at the Naval Academy filling out a personal information form with hundreds of other young men, blinking back the tears of homesickness.

"There was this guy up on a platform with a loudspeaker," VADM Konetzni recalls. "He said, put your name in block one. I got that right. Okay, date of birth in block two, yeah, I got that right."

But in a moment of distraction, he made a mistake on block three, home of record.



"I'd never heard that term. I looked at the paper of the guy sitting next to me, and he was from Miami. In pencil, I started writing 'Miami,' and caught myself, so I started crossing it out, but it was too late."

In an explosion of shouts, a second-class midshipman hauled him in front of the assembly, rang a bell and announced: "We have our first zero! And last year's zero only lasted three days!"

"You ever have that feeling when you say to yourself, gee, I've done bad things before, but why the hell am I getting ridiculed for this little thing?"

During his 10 weeks of Plebe Summer, VADM Konetzni remembered, "I got my butt kicked, I mean, hazing – yeah, I'd call it hazing. But I thought, well, maybe that's what you get for being a New Yorker and having a big mouth.

"What it taught me," he said, his voice falling to just above a whisper, "was that if we want to sub-humanize somebody, we can do it. If we want to make a guy act or think stupid, we can do that. If we want to take somebody's name away, pride away, we collectively, can do that. And I didn't like that."

VADM Konetzni admitted that earning that designation as the first zero of his class drove him to success in sports and academics. He graduated with merit and later moved on to command USS *Grayling* (SSN-646), Submarine Squadron 16, and eventually the U.S. Submarine Force, Pacific Fleet.

Despite all his personal success, however, he never forgot about his fellow plebes who were hazed, and unlike him, left the Academy.

"When I graduated, I was left with the thought, wow, what a tragic loss. I've often thought about those people – what if we had given them the treatment that they needed? Like the kid who can't fold his laundry. I couldn't fold laundry properly at the Naval Academy – you know, bouncing a quarter on the bed – I couldn't do that crap. But I got help. Maybe if they had got some, one of those guys might have ended up being the next ADM Chester Nimitz. But we'll never know, because maybe we picked on them because of a *faux pas*, or their ears stuck out, or we didn't like their religion."



**"I am convinced in any organization that if you are taking care of the weakest – and I'm not talking about the one who just can't qualify – I'm talking about the person who can't fold the laundry the right way, the person who looks different, maybe the minority, maybe the female. If you're taking care of that person, your self-awareness goes way, way up,"**

**— VADM Al Konetzni**

As Pacific Fleet Commander, VADM Konetzni saw how the practice of winnowing out those who couldn't cut it was creating a retention problem for the Submarine Force. One-fourth of all first-term submarine Sailors left the service at the end of their enlistments, a total of more than 400 a year. He resolved to change that culture while at the same time building stronger leaders for the silent service.

"I am convinced in any organization that if you are taking care of the weakest – and I'm not talking about the one who just can't qualify – I'm talking about the person who can't fold the laundry the right way, the person who looks different, maybe the minority, maybe the female. If you're taking care of that person, your self-awareness goes way, way up," he said, his whispering voice betraying how sacred he holds this belief. "You start to understand who you are. You'll learn interpersonal skills, you'll

read people's body language, you'll learn if somebody is suicidal.

"I know the best submarines are where the youngest guy, the guy who just got onboard right out of "A" School feels as if he is as important as the old man. That's powerful. That is unbelievably strong stuff." To lower the attrition numbers, he focused on instilling a sense of ownership from the skipper on down, emphasizing the simple principle that "I can't allow myself to let my troops down. They're my guys."

Then, in addition to holding his submarine skippers personally responsible for the tactical acumen and warfighting ability of his ship, he told them, "You better provide for the future of our Navy. And the way you do that is to make sure your people realize how critically important they are."

Another change during his time in Pearl Harbor was directing his COs to give their Sailors a half-day off in the middle of the week, a mandate that led to plenty of grumbling. VADM Konezni smiled knowingly in the face of criticism from the waterfront; he'd already shown during his time as CO of *Grayling* how a cut-back in the hours a submarine crew works in port could lead to higher morale and greater retention of those first-term Sailors without a reduction in standards.

"We got underway on time, every time," he recalled, with satisfaction.

To do it, VADM Konezni suggested eliminating the inefficiencies that had been a tradition on many submarines.

"You got your whole damn crew standing on the pier at seven in the morning until about 8:15, you got your little wardroom conclave, then the chiefs gotta get together," he said dismissively with a wave of his

hand. "I remember this one guy who told me that what pissed him off the most was that even if he only had to hang one tag to clean a precipitator, he couldn't get it signed until one o'clock in the afternoon."

By the time the admiral was finished, the officers and chiefs would report early to complete the paperwork necessary to allow the Sailors to begin work right away and then be able to depart on liberty once that work was completed. According to VADM Konezni, re-enlistment rates doubled, due to his direct intervention. Pulling a few strings to keep one particular Sailor on active duty drew some criticism for jumping down a few links on the chain of command, but that Sailor is about to graduate from Old Dominion University with a Navy commission.

"I remember somebody telling me that I'm too easy-going with people," VADM Konezni remembers. "I said, what do you think – I'm giving out free beer here to get promoted? I go through the same trials and tribulations as all you other knuckleheads."

Even his initiative to redirect the way the Navy deploys its forces was done with people in mind. VADM Konezni's ideas were crucial in molding the Fleet Response Plan, where regularly-scheduled, six-month deployments are supplanted by the ability to send six Carrier Strike Groups anywhere in the world within 30 days of a crisis, while having two more carrier strike groups ready to sail shortly thereafter.

The Submarine Force, as he sees it, will remain "a jewel in the nation's arsenal for national defense" and a major part of the Fleet Response Plan.



"It's the people. We got the brightest officers from the best universities in the United States. We have the best people, the smartest people."

VADM Konezni said the Submarine Force will remain necessary to fight the wars of the future by denying adversaries access to the battle space. This will drive decision-makers to build an adequate number of ships. But to operate those ships, he added, you need people – and leaders who understand their value.

"The thing that makes us worth a damn is our moral influence on people."

From that first day as a plebe to the steamy July afternoon he stood on a pier in front of his shipmates – to leave the Navy better than he found it – that's something "Big Al, the Sailor's Pal" never forgot.

JOC Foutch, is assigned to Submarine Warfare Division Public Affairs, and is a Military Editor of UNDERSEA WARFARE.





## Simulator Brings Realistic Training to Sailors

**T** Trident Training Facility (TTF) Kings Bay unveiled the newest jewel in its training crown on 25 August – the Interactive Display Equipment (IDE) training simulator. TTF is the first facility to receive a Fleet IDE, which replicates the Maneuvering Room aboard a USS *Ohio* (SSBN-726)-class submarine.

Former VADM Kirk Donald, Commander, Naval Submarine Forces, was on hand for the ceremonial ribbon cutting and dedication, and spoke about the historical importance of the trainer.

“If we expect our Sailors to do their jobs well, we must give them the right tools and the right training,” VADM Donald said. “This trainer accomplishes both of those goals. The Fleet IDE adds another dimension to our already remarkable nuclear training program and harnesses the power of computer technology to improve the effectiveness of our Sailors. This is a great day for the Navy.”

The Fleet IDE is a full-scale and completely interactive trainer that gives operators realistic, intuitive, real-time experience in the normal operations of the ship’s nuclear propulsion plant, as well as simulated casualty situations. Before construction of the simulator, Sailors assigned to nuclear-powered ships could only receive hands-on training onboard the ship. The Fleet IDE gives Sailors another, better option for training.

“The simulator gives us much more flexibility in training,” said Electrician’s Mate 1st Class (SS) Mike Mercer, one of several Fleet IDE instructors. “The Fleet IDE allows us to control every aspect of the

scenario and simulate those situations with amazing realism.”

CDR Robert Palsin, Commanding Officer of USS *Maine* (SSBN-741) (BLUE), echoed Mercer’s sentiments. “There are no limits to our training now,” said Palsin. “We can replicate the feeling and pressures of a real situation on board the submarine. Having this trainer available during our off-crew training period also allows us to train on other things while out to sea. It is an excellent addition to our training program.”

The Fleet IDE fills two rooms – one for the instructors and one for the four-man watch team. A window that separates the rooms gives the instructors a commanding view of the power plant and the actions and reactions of the Sailors training there.

Computer screens also monitor the situation and allow the instructors to program every aspect of simulated casualties.

The Fleet IDE trainer was developed and delivered by the Naval Nuclear Propulsion Program (NNPP) and is the latest innovation in NNPP’s long tradition of commitment to training. The NNPP plans to deliver a Fleet IDE for each major class of nuclear-powered submarines and aircraft carriers to the larger homeports of the ships and crews in upcoming years. Installation of a second Fleet IDE in Bangor, Washington, is scheduled for completion in 2005. The NNPP dedication to excellence through training has resulted in an outstanding safety record. Since 1955, when USS *Nautilus* (SSN-571) first signaled “underway on nuclear power,” U.S. nuclear-powered warships have

collectively steamed more than 130 million miles without a reactor accident.

J01 Spinner assigned to the Submarine Group 10 Public Affairs Office.

(above) Lead instructor ETCS(SS) James Berhalter explains the new Fleet Interactive Display Equipment training simulator to visitors following the ribbon-cutting ceremony. Behind him, two instructors run the simulator. During a training scenario, the instructors act as the various propulsion plant watch standers and monitor the full range of normal operational and simulated casualty situations. (The computer displays shown here are unclassified mock-ups.)

(below) VADM Kirk Donald, Commander, Naval Submarine Forces, prepares to take the ceremonial chop at the official opening of the Fleet IDE training simulator at the Trident Training Facility in Kings Bay, Georgia. The simulator is the first of its kind in the Navy, and Fleet IDEs for each major class of nuclear-powered submarine and aircraft carrier will be delivered to the larger homeports of the ships and crews in the next few years. Pictured at left is CAPT Larry Davis, Commanding Officer of TTF.

Photos by J01 Jennifer Spinner, SUBGRU-10 Public Affairs.



# NUWC “Reorg”

## Not Just Another

As a career submariner turned Acquisition Professional, I won't claim to be an authority on the dynamics of major organizational change. But frankly, I've watched the Navy evolve for more than 25 years now, and to call anything that happened organizationally during the first 24 of them “transformational” would be a stretch.

That opinion has changed in the past year. Perhaps it's only a matter of perspective, but from where I sit now, as Commander, Naval Undersea Warfare Center (NUWC) Division Newport, I can't help but feel that we are implementing what may be some of the most profound changes to take place in NUWC's 135-year history. It's not just about altering reporting chains and office-door nameplates, but about fundamentally restructuring the way we do our business and, in some respects, also about changing the business that we do. Part of this transformation is driven by larger efforts within the Warfare Center “enterprise” of the Naval Sea Systems Command (NAVSEA), and part of it is NUWC-specific. Regardless, it signals a sea change in how we support the Navy's undersea warfare community.

### A Proud and Distinguished History

As an organization, NUWC can be proud of its heritage. Various known as the Naval Torpedo Station, the Naval Underwater Sound Laboratory, the Naval Underwater Research and Engineering Station (NURES), the Naval Underwater Systems Center (NUSC), and most recently, the Naval Undersea Warfare Center, NUWC has steadily evolved its portfolio of activities in undersea technology to become “the Navy's full-spectrum research, development, test and evaluation, engineering, and fleet support center for submarines, autonomous underwater systems, and offensive and defensive weapon systems associated with undersea warfare.” Although NUWC is by no means the nation's sole provider of such capabilities, it is uniquely chartered b/y the Secretary of the Navy with responsibility for stewardship of them.

### The New Challenge

Despite a distinguished record of accomplishment in supporting undersea warfare since its inception, NUWC needs to look to the future to meet the enormous challenges posed by the evolving underwater threat. These needs go well beyond locating quiet diesel submarines in a complex littoral environment. They also include finding new ways to solve “old” problems, shortening development and deployment time, applying our technologies to new missions, and doing it all under budgetary pressures more severe than any in recent history.

Almost two years ago, NUWC leadership became concerned about our ability to meet these coming challenges. Not only were we still operating with an organization that hadn't changed much since the start of the Cold War, but we knew that we had a credibility problem with some of our primary customers and stakeholders. This was due to the conflict of interest that arose – not infrequently – from trying to act as both a technical advisor and a technology provider at the same time. We resolved to examine ourselves critically to see if there was a better way to accommodate the new environment. Almost at the same time, NAVSEA, NUWC's parent command, began to initiate similar alignment activities among its own four lines of business: Shipyards, Warfare Centers, Engineering, and Business Operations. Subsequently, the NAVSEA-directed changes have complemented NUWC's initiatives nicely, although they slightly changed our implementation timelines.

One of the most visible changes in the NAVSEA Warfare Centers (NUWC and the Naval Surface Warfare Center – NSWC) has been the creation of twelve Product Area Directors (PADs), each a Senior Executive holding national responsibility for a specific product area. Although the PADs still reside at the sites at which they were previously employed, their purview now extends beyond the home site itself and embraces all product-area work regardless of location. Within the scope of their product areas, the PADs exercise stewardship of the Warfare Center core equities and establish a vision and strategic plan for them. They are also responsible for reviewing work proposed by prospective customers in their product areas and determining which, if any, Warfare Center is best suited to perform it. Individual sites may no longer accept customer work independently, nor can customers freely “shop around” for a Warfare Center site of their own choosing. If a customer has work that must be done by a Warfare Center, a PAD will ultimately determine which site it goes to.

Whereas the PADs control the Warfare Centers' workloads, the Commanding Officer of each site is responsible for shaping an effective workforce and implementing efficient processes to support the work. Thus, as a site commander, I must work with every PAD that sends work to Division Newport to determine the workforce capacity and skill mix needed to handle it. Mismatches between the assigned work-

load and my workforce will become immediately apparent. Because COs are still singularly accountable for meeting our site financial targets, resolving these mismatches becomes somewhat more difficult, since “finding more work” is no longer a unilateral option. If I believe that the health of one of my core equities is in danger, I can ask the PAD for help in identifying work to sustain it. Lacking that, I must find a way to retrain or redeploy the people in the overmanned area, either temporarily or permanently, depending on the long-term prospects for the associated work. On the other hand, if the PAD intends to send more work than I have capacity for, I must either reject the portion that I cannot support or create additional capacity – by hiring, training, or outsourcing – to execute it.

The position of Director, Undersea Warfare (DUSW) was recently created as a new Senior Executive position within NUWC’s Headquarters organization to reinvigorate NUWC’s ability to offer credible “honest broker” advice to senior Navy

leadership. The position will champion a view of the Navy that looks beyond the boundaries of individual programs to see the bigger USW integrated picture. DUSW also monitors the health of NUWC’s investment in future technologies to ensure that our ability to offer potential future capabilities remains viable within the pressures of meeting near-term readiness requirements.

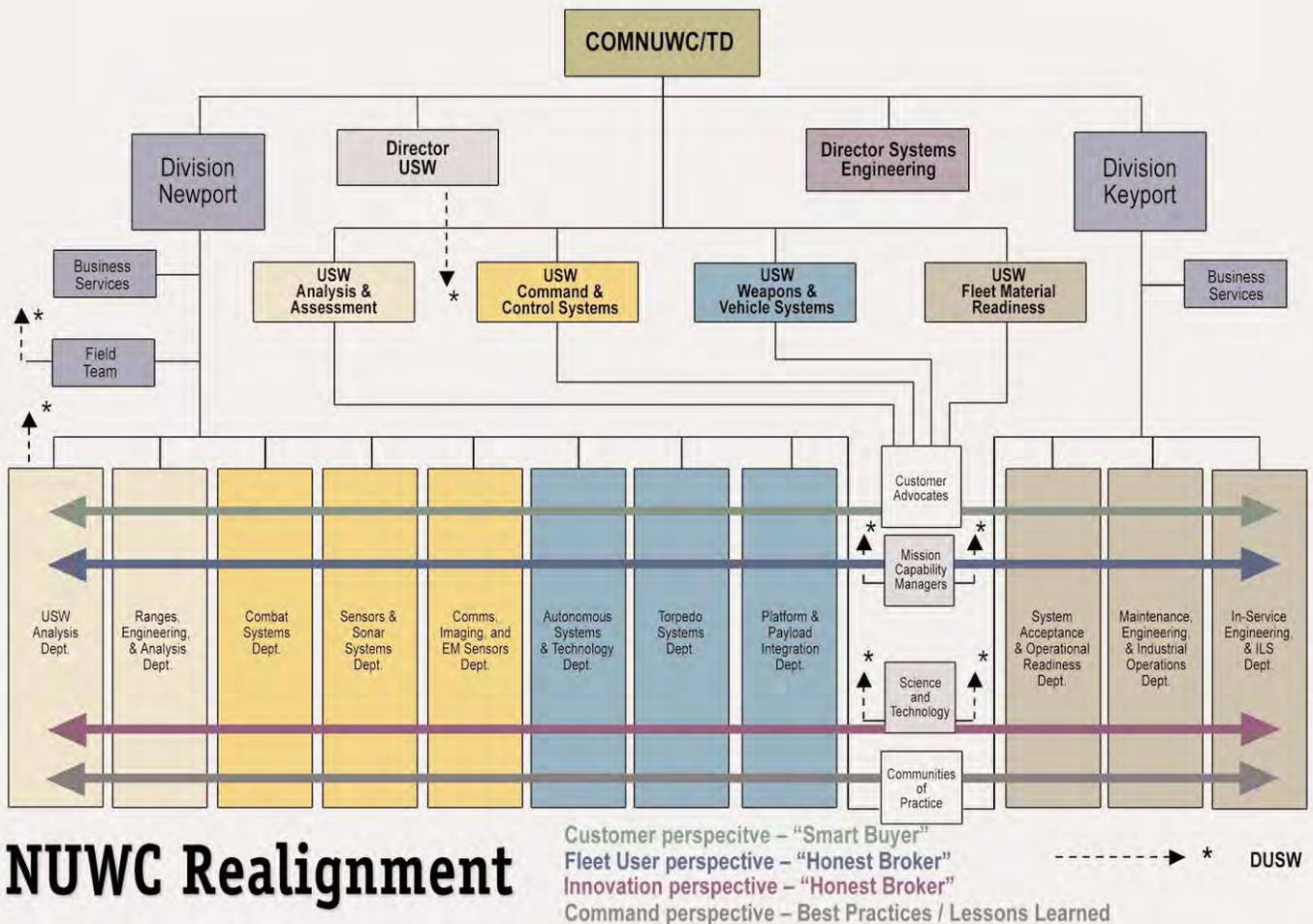
Three other significant changes have been made to NUWC’s organization. Each of them is intended to encourage – or require – horizontal integration of efforts among NUWC’s various line organizations, which can easily become stove-piped by the products they work on.

The first of these are Customer Advocates (CAs), who assist the PADs in oversight of the workload assigned to the sites. On behalf of their customers, the CAs negotiate the scope of tasking and the resources needed to accomplish it. Once the tasking is finalized, the CAs assist their PAD and the customers in monitoring each site’s performance of it. They participate

in the sites’ internal reviews of project execution, give the COs feedback on existing or potential risk areas, and help adjudicate changes in tasking scope or funding.

Mission Capability Managers (MCMs) are chartered to oversee NUWC efforts in mission areas with multiple customers – currently ASW, Strike, Homeland Security, Training, Integrated Logistics Support, USW FORCEnet, Information Warfare, and Special Warfare. As extensions of the DUSW, the MCMs provide subject area expertise and awareness of “big Navy” and joint requirements in their assigned mission areas. They are also responsible for maintaining an end-to-end, system-of-systems perspective of the technology and acquisition efforts in their mission areas, and for identifying non-traditional solutions. Although these are primarily program office responsibilities, the MCMs provide NUWC leadership and program managers an independent assessment of issues and opportunities that might arise.

*continued on page 30*



*On 10 June 2004, RADM Jim Beebe, Deputy COM-SUBPAC, RDML Jay DeLoach, Deputy COMSUBLANT, Force Master Chiefs Master Chief Electronics Technician (SS) Chris Clark (SUBPAC) and Master Chief Electronics Technician (SS) Steve Ricard (SUBLANT) shared their thoughts on the reserve component of the Submarine Force with the community's senior leadership at the Navy Submarine League meeting in Washington, DC. They took a moment to review where the submarine reserve component has been and the way ahead. The following article is a synopsis of those comprehensive discussions.*



IC2 Patrick Palmer performs periodic maintenance on the sound powered phones aboard USS Emory S. Land (AS-39).

Photo by PH2 Lou Rosales

# The Submarine Reserve

## Dynamic Partners with the U.S. Fleet

### The Build-Up of a Submarine Reserve

As we move toward the CNO's directive to operate as "One Navy," many communities like the Submarine Reserve have noted that they have actually been building a solid working relationship between the active and reserve components for quite some time. Nonetheless, the current world situation has made imperative a cultural shift from being a Naval Reserve to the "Navy's Reserve".

Compared to other communities, some might say the reserve component of the Submarine Force is relatively new – merely 70 years old. However, in these recent dynamic years, the basic role of the Submarine Reserve has evolved from supplying Sailors and submarines in time of war to one in which reservists are literally working side-by-side with their active duty shipmates. While other communities may just be hitting the deck plates with this paradigm shift, the Submarine Reserve community is ahead of the curve. This is a philosophy that we've embraced firmly for decades.

Recently, the nation celebrated the dedication of the World War II Memorial in Washington, D.C. to honor the 18.2 million men and women who served in uniform during that conflict. Members of the Guard and Reserve represented 80 percent of this total, or 14.5 million personnel. In the Navy, the citizen-sailor accounted for 90 percent of the crews who sailed in the greatest armada of recent times. In some submarines, the crew and wardroom were composed entirely of reservists, with the exception of the commanding officer who was most often a Naval Academy graduate. According to Clay Blair in his 1975 book *Silent Victory*, a "skipper problem" for the Pacific Submarine Force became a growing issue as the war dragged on, and the supply of qualified Naval Academy graduates ready to command submarines dwindled.

During the closing months of 1944, at the urging of Fleet Admiral Chester Nimitz, VADM Charles Lockwood, Commander Submarine Force U.S. Pacific

Fleet, selected 11 USNR officers to assume command of Pacific Fleet submarines. Seven of these skippers conducted a combined total of ten war patrols during 1945 and subsequently sank 12 Japanese vessels. One of these men, LCDR James Hunnicutt Jr., placed USS *Carp* (SS-338) in commission and then sank five Japanese vessels during the *Carp's* only wartime patrol. LCDR Hunnicutt's extraordinary efforts were rewarded with the Navy Cross.

Victory against the Axis powers led to a general demobilization of all the armed services. However, Secretary of the Navy James Forrestal recognized the significant contributions that the submarine reserve had made in winning the war in the Pacific and wanted to maintain this strong capability. He saw a world that was still very unstable and where early signs of the Cold War were starting to emerge. With this in mind, Forrestal demanded that the Navy, "Build up the submarine reserve" as a way of keeping the combat-hardened submarine veterans within short reach.

About that time, CDR Dick Laning had just decommissioned the USS *Pilotfish* (SS-386) and was assigned the job of building up the Submarine Reserve in the New England area. He was impressed with the dedication and enthusiasm of those local reservists as they met monthly in warehouses on the Boston piers. In the hope of keeping morale and retention high, CDR Laning came up with the idea of using surplus World War II submarines as training platforms for the submarine reserve, instead of scrapping them as excess. He went to Washington and briefed his plan to both the CNO, ADM Chester Nimitz, and Secretary Forrestal. Their response was straightforward: "Fine. Do it." CDR Laning walked out of the Pentagon with 35 submarines for the Naval Reserve.

structure of the latter.

In the aftermath of the Cold War, the senior leadership of the submarine reserve realized that while a structure based on mass mobilization may have been appropriate for a traditional wartime scenario, it was inadequate for the fluid nature of the coming era and its potential short-term demands. As RDML Jay DeLoach remarked, "We could no longer afford to think that mustering at the local reserve center to conduct General Military Training (GMT) was enough. Likewise, having two separate entities that didn't speak the same language wouldn't work. We began to realize that the submarine reserve needed to be relevant to current operations in the fleet on a day-to-day basis."

Is the reserve component making a difference? The numbers speak for themselves. In Fiscal Year 2003, the submarine reserve provided direct fleet support in the amount of 67,000 total man-days. The majority of this effort included work with command staffs, maintenance support on tenders and waterfronts, operational augmentation and watch-standing, force protection, and finally assistance with special projects. As RADM Beebe puts it, "Very little time is devoted to what was previously considered 'Reserve Overhead,' and our focus is to spend the precious time we do have in support of the fleet."

"Since assuming my current position, I have challenged our Sailors to commit 85 percent of their time and effort toward activities that directly support their active duty



Photo by PH2 Lou Rosales



(far left) MM1 Tim Brennan removes rusted studs from a damaged high pressure drain orifice flange onboard the USS *Emory S. Land* (AS-39). Home ported in La Maddelana, Italy, *Emory S. Land* is the Navy's only forward-deployed submarine tender in the Atlantic area.

(near left) Members of the Submarine Advisory Team review a chart in preparation for the deployment of the USS *Saipan* Expeditionary Strike Group.

### Transforming the Force During the Cold War

From 1946 to 1972, Navy Reservists drilled in 26 cities on 44 diesel boats. Submarines like the USS *Silversides* (SS-236) in Chicago; the USS *Tambor* (SS-198) in Detroit; and the USS *Carp* (SS-338) in Boston served as training platforms on which Sailors prepared themselves for active service in the event that a global war heated up. For the most part, their training utilized surplus equipment and platforms from the active-duty fleet. With the shift to nuclear-powered submarines and a transition away from reserve units focused on platforms and hardware, the program gradually morphed into the submarine reserve we know today. Although this transition did not take place overnight, the submarine reserve became increasingly focused on its own reserve obligations and infrastructure, and by late in the Cold War, it had become fairly independent of the active-duty component and not truly aligned with the mission or

### Today's Submarine Reserve

Today, the submarine reserve is not only relevant, it is a true partner of the active-component force. "We are in the forefront of the concept of being 'ready and fully integrated' because we shifted to this philosophy over ten years ago," noted RADM Jim Beebe. As Submarine Reserve Director in the mid-1990s, RADM Ron Morgan generated a series of memorandums of understanding between the reserve command and the Submarine Force leadership. These agreements made the active-component commanders the official reporting seniors for their associated reserve units. With these agreements and subsequent organizations in place, the submarine reserve and Submarine Force became the prototype for what the rest of the 85,000 person reserve force will become as a result of the U.S. Fleet Forces Command's Zero Based Review and Active/Reserve Integration (ARI). "The bottom line is that we've already become accustomed to being an aligned and responsive force," said RADM Beebe.

commands," noted DeLoach. This is in keeping with a recent observation by Chief of the Navy Reserve, VADM John Cotton. "We can no longer afford to have separate and unequal forces. We can't have what we used to call 'weekend warriors.' The average reservist now doesn't do weekends. The average reservist now supports what I call supportive commands whenever he can," he noted.

### How the Naval Reserve Contributes Daily to the Fleet

Currently, the submarine reserve directly supports the Submarine Force by performing three critical functions: 1) supporting Strike Group operations onboard aircraft carriers and Expeditionary Strike Groups (ESGs); 2) performing maintenance and waterfront support on submarine tenders and at pier side facilities; and 3) providing direct staff support and augmentation – including force protection. This direct support comes from over 2,700 reservists attached to 96 submarine reserve units across the country, split almost evenly between SUBLANT and SUBPAC.

## Strike Group Operations

Submarine reservists provide the bulk of Submarine Advisory Team (SAT) support for our Carrier and Expeditionary Strike Groups both prior to and on deployment. During Operations Iraqi Freedom, Enduring Freedom, and Noble Eagle, submarine reserve SATs provided the water-space management and control of all U.S. and coalition submarines engaged in striking Iraq. Reserve teams have also manned critical positions in joint and combined exercises like Global Guardian, Ulchi Focus Lens, Dogfish, Northern Lights/Northern Edge, and RIMPAC. During the height of hostilities in Iraq and Afghanistan, some of these exercises would not have been possible without help from the reserve. In fact, in a June 2004 interview, VADM Cotton noted that 24 percent of the Naval Reserve force today – approximately 22,000 personnel – is providing operational support under orders. “It’s not a weekend drill force; it’s an operational-support, ‘get-to-your-supported-command’-type force,” said VADM Cotton. In Fiscal Year 2003, the submarine reserve provided over 9,300 man-days of operational support to the fleet.



Photo by MA2 Antonio G. Cuin

LT Enrique Morales (left) and SN Ian Ricketts with COMSUBGRU-10 Force Protection Detachment 2 scan the harbor at Kings Bay, Georgia. Approximately 400 of the 2,700 submarine reservists have been mobilized since the 11 September terrorist attacks to provide security on our bases and waterfronts.

## Maintenance and Waterfront Support

Both active-duty submarine tenders, USS *Frank Cable* (AS-40) and USS *Emory S. Land* (AS-39), have several dedicated reserve detachments that are responsible for specific jobs, such as maintenance and refurbishment of fan rooms, berthing, and head spaces. On the waterfront, submarine reservists also assist Naval Submarine Support Command (NSSC) reserve detachments in working on and in sails, conducting topside preservation and preventive maintenance, performing major maintenance projects on torpedo retrievers, and assisting with special projects onboard the boats. Collectively, over 15,400 days of maintenance support has been provided by the submarine reserve in Fiscal Year 2003.

Additional industrial capabilities are resident in the Reserve Intermediate Maintenance Activities (RIMAs). These facilities manufacture and deliver such items to the fleet as bunk pans, lockers, bunk curtains, and large assemblies like portable ship’s brows and waterfront guard posts. The 13 RIMAs, located mostly in heartland areas like Denver, Phoenix, Louisville, and the Great Lakes, give reservists the opportunity to build products that support the force while honing maintenance skills critical for sustaining our boats at the waterfront and on tenders. “We see this as improving quality of life, while sharpening skills,” said Force Master Chief Chris Clark.

## Staff Support and Force Protection

Approximately 400 of 2,700 submarine reservists have been mobilized since the events of 9/11 to provide security on our bases and waterfronts. Reservists have also provided security for our submarines during Panama Canal transits. A pool of reservists – primarily from maintenance ratings – is also specially trained as an Auxiliary Security Force to provide security during the higher Force Protection Conditions Charlie and Delta.

Reservists supporting the active-component staffs are fully incorporated into their respective organizations, providing a wide variety of services from command-center watch-standing to special-project support. For example, Force Master Chief Steve Ricard was mobilized for one year to lead a security force of 100 submarine reservists guarding our submarine assets in New London. “In addition to their technical skills, one of the important elements that our reservists bring is a high degree of

maturity,” said Master Chief Ricard. “As a result, we get the job done with minimum supervision and often can mentor some of the junior enlisted from the active force.”

Submarine reservists also provide much-needed support for various other staffs. A number of reservists are actively involved in recent training transformations within the Submarine Force. They support the Submarine Learning Center and many of the other submarine schoolhouses, assisting in the development of Five-Vector Models and documenting the knowledge, skills, abilities, and tools (KSATs) that will be needed for enlisted personnel in the Submarine Force to advance. Moreover, reservists are also working on developing a concept of operations for the forthcoming SSGNs.

## A Big Bang for the Buck

In addition to providing a multitude of capabilities, the Naval Reserve provides its services at a very low cost. For example, the average cost to the Navy for an enlisted Navy reservist is approximately \$11,000 per year. For an officer, the cost is approximately \$22,000 per year. The reservists’ active-duty counterparts cost roughly five times that amount. These expenditures are multiplied by the fact that most reservists contribute well beyond the minimum requirement of one weekend each month and two weeks per year. Increasingly, reserve positions are filled by non-prior service personnel with solid technical skills. In many instances, these members already have much of the specialized training that the Navy would otherwise have had to pay for. They are employed throughout our diverse civilian industrial base as well as in the government. They bring unique civilian skills that can be leveraged to enhance the Navy’s overall capabilities.

In addition to the specific support described above, the submarine reserve also provides many services that are less suited to their active-duty counterparts. “Unlike the early days of our community where we were limited to major ports, submarine reserve assets are spread among 28 states supporting 42 active component commands,” remarked RDML(select) Scott Van Buskirk, SUBLANT Chief of Staff. “Geographically, these reservists also have a significant presence in smaller communities not typically touched by our active-component commands, and specifically in our nation’s heartland.

*continued on page 30*

# PCU North Carolina Crew stands up and takes CHARGE



Photo by J01 Donald P. Rule

Northrop Grumman Newport News President Thomas C. Schievelbein displays the initials of the Ship's Sponsor, Mrs. Linda Bowman, 2nd from left, during the keel laying ceremony for *North Carolina*, the newest *Virginia*-class submarine. Accompanying them are Director, Navy Nuclear Propulsion, ADM Frank "Skip" Bowman and North Carolina Senator Elizabeth Dole.

The fourth *Virginia*-class submarine, Pre-Commissioning Unit (PCU) *North Carolina* (SSN-777) has begun the process of becoming an active Navy vessel. On 30 June, the first group of *North Carolina's* crew reported for duty and started learning every aspect of the *Virginia* class.

New ships are manned in three stages: Alpha, Bravo, and Charlie. Alpha manning primarily consists of nuclear engineers, who will spend the next few years learning the propulsion systems on the Navy's newest class of submarine. *North Carolina's* Prospective Commanding Officer Commander, Edward L. Herrington, said the initial crew has to be well qualified for its job. "You really need a Sailor with a lot of initiative," he said. "It takes a Sailor who can respond to new technology and really adapt to a new approach to submarining."

"The Navy screens each and every one of them, and those selected are all top quality Sailors," he added. "They had to perform well when they went through their training pipeline."

Machinist's Mate 3rd Class Jeremy Willis graduated from nuclear power school in July and is now attached to PCU *North Carolina*. While he is one of the newest submariners onboard, he feels even junior Sailors can contribute to the success of his boat.

"We have a different perspective than everyone else, because we've never done anything like this before," Willis said. "So that kind of creates fresh ideas for approaching old traditions."

It will be about two years before PCU *North Carolina* is ready to go to sea. In that time, civilians at Northrop Grumman Newport News Shipyard will do most of the work on the boat. Still, the *North*

*Carolina* crewmembers will be intimately involved with its construction.

Northrop Grumman *Virginia*-class Submarine Construction Director Bob Meyer said, "With the type of modular construction we're doing on the *Virginia*-class submarines, the crew gets an opportunity to come in earlier, and they start owning systems much earlier."

Herrington said, "Getting here early enough to identify problems is absolutely critical to the success of submarines like *North Carolina*."

"It's amazing to see the crew owning systems when you don't have the whole ship together," added Meyer. "They start taking control, and they start helping with construction, because they help us focus on the key systems."

Northrop Grumman Newport News Submarine Program Vice President Becky Stewart said it is critical that the crew be involved with the development of the new boat. "It's absolutely a partnership, and we press hard to make sure they're involved as much as they can be," she said.

Electronics Technician 1st Class (SS) Dennis Kee agreed that it's an important partnership. "We're all on the same team," he said. "I mean, they get paid to build the ship, we get paid to take it to sea. We have to be there to support them just as they have to be there to support us during the process."

While construction is underway on *North Carolina*, Kee has been "training, getting ready for training, sitting in training, taking notes, whatever I have to do. There's a lot we have to learn so we can eventually take our ship to sea."

Kee has been on *North Carolina* since "minus day one." It is the first time he has been attached to a pre-commissioning unit. He said the attitude in a PCU is the biggest difference he sees in comparison to a commissioned submarine.

"When you've been to sea for a while, there's a climate that's already instilled in everybody, be it good or bad," he said. "But here, everyone has a chance to build a good attitude. That's always a plus."

Master Chief Electronics Technician (SS) William Jones, prospective Chief of the Boat (COB), said the crew's involvement is more beneficial for the crew than for the boat itself.

"You have to remember that the hull and all the equipment in side is cutting-edge, new stuff," he said. "So actually getting to see them put together something that no one will ever see again helps in the understanding and qualifications."

Willis said part of the reason he joined the Submarine Force was so he could "see things that no one will ever see."

"It's certainly an awesome opportunity, when you look at a ship that's this technologically advanced, to be able to come in and from the ground up try to establish ownership," said Herrington.

"The *Virginia*-class is really the first submarine that's built to truly carry out all the missions that submarines are designed to carry out," he added.

With its innovations and new technology, as well as its first crewmembers' enthusiasm and talent, the future is nothing but bright for *North Carolina*.

JOSA Zask is assigned to Commander, Naval Submarine Forces Public Affairs.



Photo by J01 Donald P. Rule

(above) Senator Elizabeth Dole delivers remarks as keynote speaker during the keel laying ceremony for *North Carolina*. "The *Virginia*-class nuclear-powered submarine is one of the most sophisticated machines ever built," she said.



# World's First NUCLEAR-POWERED SUBMARINE CELEBRATES 50 YEARS

Photos by Gary Steinhaus

U. S. NAVAL DISPATCH

NO. 1007

FROM: USS NAUTILUS SSN 571

ACTION: CONSUBLANT

INFO:

NJOE DE NWCL  
-T-YZZF  
-R-1716M1Z -FM NWCL -TO YZZF GR 1/2 BT

UNTERWAY 1133R ON NUCLEAR POWER BT....

TOP / 1133R WU/ELT  
FK. / 1133R  
FBR

TO	1133 R	DATE	17 JAN 55	REF NO.	1716M1Z
1		15		21	
2		16		22	
3	X	17		23	
4		18		24	
5		19		25	
6		20		26	
7		21		27	
8		22		28	
9		23		29	
10		24		30	
11		25		31	
12		26			
13		27			
14		28			
15	X	29			
16		30			
17		31			
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

Today, nuclear-powered submarines patrol the globe, navigate under the polar icecap, and operate underwater for weeks on intelligence-gathering, reconnaissance, and covert strike missions. While powering ships at sea by splitting the atom will never be entirely “routine,” at least it no longer inspires excited headlines and admiring gasps from an incredulous public.

(left) Bunting drapes *Nautilus* for the launching as reporters and film cameras are stationed in a nearby press box to document the ceremony. What began as a fog-shrouded morning turned into bright sunshine as dawn broke on the Navy's nuclear age.

Less than a decade after nuclear weapons ended World War II in the Pacific, atomic scientists succeeded in overcoming the challenge of designing a reactor small enough to fit within a submarine and harnessing that same awesome energy to generate sufficient power for operating a ship beneath the surface almost indefinitely.

That effort to design the world's first nuclear-powered ship led directly to the development of most of the world's nuclear power plants, which today offer a cheap and environmentally-safe alternative for generating electricity.

**“Underway on nuclear power”**

That simple message pictured on the opposite page from *Nautilus's* commanding officer, then-CDR Eugene P. Wilkinson, on 17 January 1955 represented far more than a skipper's routine report to his squadron superiors. It announced a new era in naval warfare and in one stroke made obsolete virtually all other submarines around the world.

Fifty years later, USS *Nautilus* still exerts a powerful influence on the imagination of submarine Sailors. Even as we savor the excitement of our new *Virginia*-class, the promise of integrated power systems, and the prospect of technologies yet unimagined, the example of *Nautilus* – “underway on nuclear power” – continues to remind us that all things are possible.

JOC Foutch, from Submarine Warfare Division Public Affairs, is a Military Editor of UNDERSEA WARFARE.

(below) Hundreds of well-wishers gather at the Electric Boat Company in Groton, Connecticut, on 21 January 1954 to witness the launching of USS *Nautilus* (SSN-571), the event that brought the U.S. Submarine Force into the nuclear age.



(below) In addition to ADM Rickover (far right), other legends of the Submarine Force were present at the ceremony in Groton. Then-CDR Ned Beach (far left, holding gloves) was the Naval Aide to President Eisenhower from 1953 to 1957. *Run Silent, Run Deep*, his gripping novel about the sacrifices of the silent service in World War II, was published one year after the launching.



(left) First Lady Mrs. Mamie Eisenhower – holding the red roses – was the wife of President Dwight D. Eisenhower and served as the ship's sponsor for *Nautilus*. She christened the ship in the traditional ceremony of smashing a bottle of champagne on the stem as it slid into the river.

How far the Submarine Force has come  
in the 50 years since *Nautilus* took the water!

# Eyes from the Deep

## A History of U.S. Navy Submarine Periscopes

Mention the word “submarine” to anyone, and a host of images will spring to mind. The sleek, low, black silhouette pier-side or sliding through the ocean. The drama of an “emergency blow” as the boat broaches the surface in a volcanic eruption of water. And of course, the sinister image of the tip of a periscope feathering the surface, hinting at what lies lurking below. And inside? The one image indelibly marked on the popular mind is that of the commanding officer crouching in the middle of the control room peering through the periscope – “dancing with the gray lady.”

USS *Adder* (SS-3) running sea trials, circa 1903. *Adder* was the first U.S. Navy submarine to carry a periscope, in this case a British-made “altiscope,” and this photograph depicts one of her first trials with the device.

Photos courtesy of the Naval Historical Center

These last two images arise from one inescapable fact. Once submerged, submarines are essentially blind to the visual world above the surface. Windows and portholes are more or less useless, since they provide only the minutest view of the submarine's surroundings, especially at depths where the sun's light never penetrates. Early submariners realized early in the game that they needed a way to see at least some distance above the surface of the water while submerged, without compromising their boats' inherent stealth.

In 1854, the Frenchman Marié-Davy designed an "optical tube", which was simply a cylindrical housing with mirrors placed at 45-degree angles at each end. Similar primitive devices were first added to submarines in the 1880s, but they provided only a very poor view of the surface, often less than 10 degrees wide, and were generally considered next to useless. Various minor improvements were made to this design in the following years by various navies and inventors, but a breakthrough came in 1902, when American submarine pioneer Simon Lake included his patented "omniscopes" on his own 65-foot, 130-ton *Protector*. The omniscopes, which Lake had envisioned as early as 1893 in his application for a patent for his "Submarine Vessel," consisted of eight prisms, including two trained ahead, two astern, and one on each quarter. While the forward-looking prisms afforded an upright view, the views to the side were on edge,

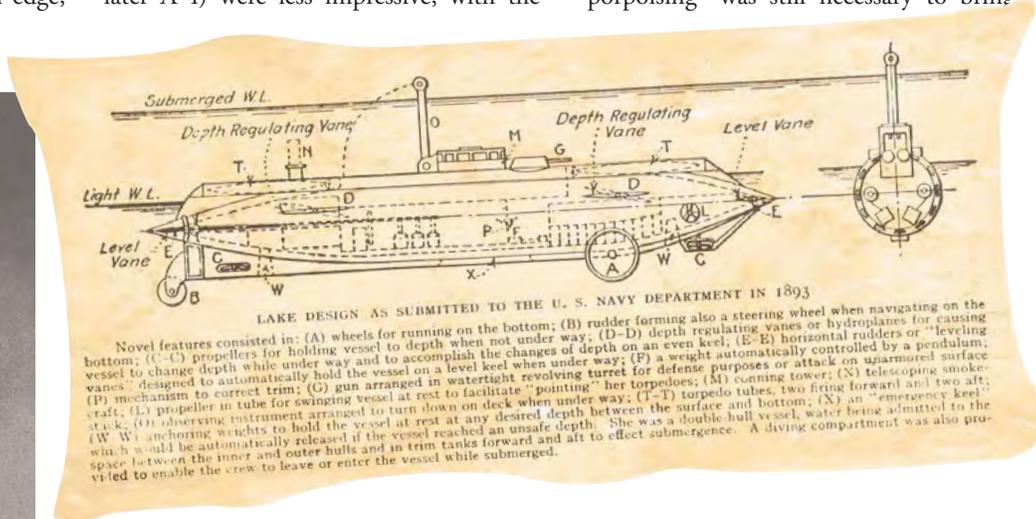
and the rear view was inverted. This allowed the operator to view the entire horizon from below and even to estimate range. Moreover, the omniscopes could be rotated, but the view was considered excessively dim.

Around 1900, Irish-born American inventor John Holland, the so-called father of the modern submarine, experimented with a lens and mirror system called a *camera lucida* that was mounted in a long tube and projected an image of the above-water scene onto a white sheet of paper. However, this technique provided little advantage, because the image gave no sense of distance and was essentially the same as viewing a photograph. Holland abandoned this approach and reverted back to the then-standard method of fitting a small conning tower with view ports on top of the hull and "porpoising" the submarine at the surface so that the conning officer could establish his course and aim torpedoes when the tower broke the water. Unfortunately, this approach had the adverse effect of revealing the attacking submarine to the enemy.

The first U.S. Navy periscope was a British-made "altiscope" rigged through the forward ventilator of USS *Adder* (SS-3, later A-2). The fixed-direction device underwent trials in November 1902 and impressed the trials board, but they asked for additional improvements, including two different lengths. Follow-on tests onboard *Adder* and USS *Moccasin* (SS-5, later A-4) were less impressive, with the

CO of the test boats stating in September 1903 that he preferred Lake's omniscopes. The Navy attempted to purchase periscopes from Lake, but he was only interested in selling entire submarines. In any event, the omniscopes were apparently too large physically to gain lasting favor. Electric Boat, created in 1899 with the Holland Torpedo Boat Company as a wholly owned subsidiary, developed a rotating periscope, but these eventually fell out of favor because, as it rotated, the image rotated as well, so that when the periscope faced aft, the image was inverted (similar to Lake's omniscopes). It appears now that while periscopes had become standard equipment on U.S. submarines by 1905, their design had not yet been standardized. The Navy continued to experiment with both fixed and rotating periscopes – the latter with either a fixed eyepiece or walk-around design – and varying sizes and diameters. In 1909, the Navy also began experimenting with periscopes that could partially retract into the submarine, to reduce drag. As a result of this continuous experimentation, the Navy only awarded small specialized periscope contracts as new submarines were built or as replacement optics were needed.

Meanwhile, Holland still refused to use these early periscopes, believing that they were too limiting operationally. Because the early instruments were relatively short, with a fixed height, a certain amount of "porpoising" was still necessary to bring



(above) Simon Lake's design for a "Submarine Vessel," which he submitted to the Navy in 1893. Even at this early date, Lake's design clearly includes a periscope-like device that could be folded flush with the submarine when underway (similar to the periscope and radio/ESM mast on the Navy's new Advanced SEAL Delivery System).

(left) Simon Lake in an undated photo. Lake was one of the earliest submarine pioneers to incorporate a periscope in his designs. His "omniscopes" was preferred by some early submarine captains because it afforded them a 360-degree view of the surface, unlike other contemporary fixed-direction periscopes.



the boat near the surface. If the periscope tube was too short, the submarine hull could easily broach the rolling waves, but if it was too long, the image became too dim and was significantly distorted by vibrations in the mast induced by the moving water. A thicker tube damped the vibrations but also increased the wake created by the periscope as it cut through the surface of the water.

The basic design for the modern periscope was perfected by the industrialist Sir Howard Grubb in Britain. His father founded a Dublin telescope-making firm, which Grubb eventually inherited. Renowned for his optical expertise, Grubb was commissioned to develop periscopes for the British Royal Navy's new Holland-designed submarines in the early 1900s. Improving upon Lake's omniscopes design, Grubb eventually perfected his own version during World War I, which was installed on the majority of the British Royal Navy's submarines, and on several U.S. Navy boats. The Grubb periscope and subsequent variants remained the submarine's only visual aid for over fifty years, until underwater television was installed aboard the first nuclear-powered submarine, USS *Nautilus* (SSN-571).

From these early days through World War II, various improvements were made to periscopes, including the ability to rotate and be retracted into the hull. This allowed periscope tubes to become longer while the diameter was decreased to reduce wake. Around 1911, Dr. Frederick O. Kollmorgen proposed the introduction of two telescopes into the periscope, instead of a series of lenses. This allowed the window at the top of the periscope to

become a simple piece of glass, as opposed to a prism, which in turn allowed for a much smaller head. The telescopes also made it easier to develop tubes of various lengths because of the lack of intermediary lenses. In 1916, during World War I, Kollmorgen formed the Kollmorgen Corporation, which quickly became the dominant U.S. periscope manufacturer. The two-telescope design was tested during the war, and became standard for periscopes into the modern day.

In the late 1930s, submarine operators convinced the Bureau of Ships to develop a new type of periscope that eventually became the "needle nose" Type 1 attack design. This featured a tube that tapered at its head to reduce the surface wake. Recognizing that by this time aircraft were a major threat to submarines, Kollmorgen in 1940 offered a modified Type 1 periscope, dubbed the Type 2. The Type 2's field of view extended to 90.5 degrees of elevation, which enabled the attack periscope to cover the entire sky. The Type 3 designation was used for earlier large-head search periscopes, but this was replaced in World War II by the Type 4 night periscope, which featured a much fatter head (for greater light-gathering power) and a shorter tube (to reduce loss of light inside). A major innovation during this period was the advent of quality periscope photography. Throughout the course of World War II, most submarines sailed with two instruments – an attack periscope and a search/night periscope. The Type 2 periscope could only operate during daylight, but it was known for superb optics and minimal wake. Improvements were made for greater depth, improved optics and optical coat-

(above) This photograph, circa 1943, clearly depicts the "needle nose" periscope design introduced several years earlier. This unidentified fleet-type submarine is most likely carrying a Type 3 search periscope forward and a Type 2 attack periscope aft.

(right) An officer aboard USS *Bullhead* (SS-332) "dancing with the gray lady." This photo was taken during a Pacific war patrol in the spring of 1945.



ings, and photo capabilities, and it remained in use through the 1990s.

By the 1950s, evolutionary improvements to the Type 4 design resulted in the Type 8 periscope. Frequent modifications during the decades since have made it one of the primary “hull-penetrating” periscopes in the fleet today, used on all USS *Los Angeles* (SSN-688)-, USS *Seawolf* (SSN-21)-, and USS *Ohio* (SSBN-726)-class boats. The Type 8 periscope features multiple levels of optical magnification, a day-and-night viewing capability, and an antenna system for EHF Low Data Rate (LDR) satellite communications.

Also in the 1950s, a special stabilized periscope, the Type 11 “star-tracker,” was developed specifically for ballistic missile submarines to facilitate the more accurate navigation needed for missile launches. It was designed to take azimuth sightings of stars to update the planned Ships Inertial Navigation System (SINS), and it was the first periscope developed specifically for the nuclear-powered age.

With the advent of the *Los Angeles*-class fast attack submarine design in the late 1960s, the Navy developed a new attack periscope, the Type 18, which offered 18-times magnification, as opposed to its precursor’s eight. Kollmorgen again won the contract to design and build the periscopes, partly because their design allowed using a camera without removing the periscope’s face-plate. This design eventually permitted the use of television cameras, whose images can be displayed throughout the submarine and recorded. The Type 18 periscope is one of the primary hull-penetrating periscopes in the fleet today, used on all *Los Angeles*- and *Seawolf*-class submarines. Important features of the Type 18 include multiple magnification levels, single-axis stabilization, digital photography, low-light image intensification, color television, and day-and-night viewing capabilities. The Type 18 periscope is currently undergoing upgrades for a video package known as SUBIS (Submarine Imaging Subsystem), a set of analog video and digital still cameras that record the view from the periscope and provide image enhancement software for image analysis.

Although the Type 18 represents the current state-of-the-art in U.S. submarine periscopes, the Navy’s new USS *Virginia* (SSN-774)-class submarine will be getting

a completely new set of eyes. *Virginia*’s AN/BVS-1 Photonics Mast has replaced the traditional optical lenses and prisms of conventional periscopes with electronic imaging equipment. Each *Virginia*-class submarine will have two photonics masts that do not require physical penetration of the ship’s hull, but instead “telescope” out of the sail. Importantly, this allows *Virginia*’s Control Room to be moved from the cramped first deck to the more spacious second deck. Additionally, there will be no “gray lady” to dance with – or take up valuable control-room space – since the customary periscope in its below-deck well gives way to a fiber optic system that carries images from the photonics masts to two workstations and a commander’s control console, each equipped with two flat-panel displays and a keyboard, trackball, and joystick. The masts are equipped with three cameras – color, high-resolution black-and-white, and infrared – in addition to a mission-critical control camera in a separate, pressure-proof and shock-hardened housing and a laser range finder that will provide accurate ranges to targets and aids to navigation. All of these sensors are housed in the mast’s rotating head.

CAPT David Portner, the Program Manager for the Imaging and Electronic Warfare Program Office, notes that “the Photonics Mast is one of the revolutionary systems aboard *Virginia*. Its digital imagery design eliminates the need for a major hull penetration required for optical periscopes. Not only does it keep the CO from having to focus entirely on the top-side scene, but it has allowed the ship designers to break the hard link between the sail and the Command and Control System Module (CCSM). In doing so, *Virginia*’s sail has been moved forward for improved hydrodynamics and its CCSM relocated down one deck and aft, affording this critical space more room and an improved layout. The non-penetrating design also increases hull integrity and simplifies maintenance.”

In a hundred years, submarines have progressed from having to porpoise at the surface to see outside, through crude viewing devices fixed in height and direction, to today’s hull-penetrating, multi-purpose, camera-equipped scopes, which allow the boats to get a clear view of the outside world from up to 60 feet below the surface,

while revealing almost nothing of themselves.

And yet, today’s periscopes are based on the same fundamental principles of prisms, lenses, and telescopes that their predecessors exploited a century ago. But radical change is on the way. With the first of the new *Virginia*-class submarines already in the water, the submarine’s capability for viewing the world above the surface is taking off in the first fundamentally new direction since the days of John Holland and Simon Lake.



Mr. Holian is an analyst with Anteon Corporation in Washington, D.C. and a Contributing Editor to *Undersea Warfare*.

(above) Kollmorgen’s Photonics Mast, the next generation in submarine optics. The infrared camera is located in the lower rectangular housing, while the optical cameras and laser range finder are located directly above. To the right is the mission critical camera, and the mast head is topped by the antenna assembly.

#### Bibliography:

- Friedman, Norman, *U.S. Submarines Since 1945* (Annapolis, MD: Naval Institute Press, 1994)
- Friedman, Norman, *U.S. Submarines Through 1945* (Annapolis, MD: Naval Institute Press, 1995)
- Harris, Brayton, and Walter J. Boyne, Ed., *The Navy Times Book of Submarines: A Political, Social, and Military History* (New York: Berkley Books, 1997)
- Hovgaard, William, *Modern History of Warships* (London, 1920)
- Poluhovich, J.J., *Argonaut, the Submarine Legacy of Simon Lake* (Texas A&M, 1999)

The 21-year career of the *Los Angeles-class* submarine *USS Portsmouth* (SSN-707) came to an end this summer, as the attack submarine traveled to Virginia to deactivate.

*Portsmouth* left San Diego in late summer on route to the Norfolk Naval Shipyard, where the crew held a decommissioning ceremony in September. They will then work through the winter, dismantling the boat that has been a second home to hundreds of Sailors since the early 1980s.

Photo by PH1 David A. Levy



MM3 Adan Rodriguez raises the National Ensign as *Portsmouth* prepares to get underway.

# USS *Portsmouth* Deactivates After 21 years of Service

*Portsmouth* Commanding Officer, CDR Kevin Brenton and ET3 Guillermo Juarez conduct a sunset lookout watch.



*Portsmouth* was commissioned 1 October 1983, in Portsmouth, New Hampshire, one of its two namesake cities. Ironically, her other namesake is Portsmouth, Virginia, home of the Norfolk Naval Shipyard, where she will be deactivated. Three weeks after its commissioning, *Portsmouth* headed to the Caribbean to support the U.S. overthrow of the island nation of Grenada's violent Marxist dictatorship. A few months later, the boat transited the Panama Canal to reach San Diego, her permanent homeport. While assigned to San Diego, the boat has embarked on nine extended cruises and three shorter deployments.

"A budget decision had to be made about the boat. It is more than 20 years old, and we're reaching the end of the reactor core life," *Portsmouth's* commanding officer CDR Kevin Brenton explained. "We either had to refuel or decommission."

(right) MMC David Noel, Leading Chief Torpedoman assigned to *Portsmouth*, performs a pre-load inspection inside a torpedo tube.

(below) *Portsmouth's* crew conduct's a hot run toxic gas drill while underway.



Photo by PH1 David A. Levy



Photo by PH1 David A. Levy

If *Portsmouth* remained in the fleet, extensive structural testing in a dry dock setting would have been conducted, an expensive but necessary process for submarines remaining in service beyond their first 20 years, Brenton said. As a *Los Angeles*-class submarine, the boat is capable of serving the fleet for at least another 10 years. According to CDR Brenton, however, Navy officials have decided to divert the funds the boat would need to stay in service to newer submarines.

He stressed the decision to retire *Portsmouth* early had nothing to do with the boat's accomplishments or its record in the fleet. The boat has earned four Meritorious Unit Commendations and five Battle Efficiency (Battle "E") awards over the years, along with the Navy Commendation Medal and numerous awards recognizing superior performance by several departments, including engineering, navigation, and supply.

“It is an extremely proud crew and ship. *Portsmouth* has maintained a great reputation for many, many years,” said CDR Brenton, explaining his own disappointment in seeing the boat leave the fleet.

“No commanding officer wants to give up the reins and go into the shipyard to watch their ship taken apart,” he said, explaining many of the boat’s parts will be used for other submarines and smiling at the idea of *Portsmouth’s* spirit supporting the fleet aboard those other boats.

It has only been a few months since *Portsmouth* supported the fleet itself. *Portsmouth* returned to San Diego from a six-month Western Pacific deployment in February. Two months later, Brenton and

his crew learned of the decision to decommission the boat. Even after receiving the disappointing news, they traveled to the Gulf of Alaska in June to protect the aircraft carrier, USS *John C. Stennis* (CVN-74), during Northern Edge, an annual air exercise. Now the crew is preparing for their transit to the East Coast and for the dismantling process that will begin once they get there.

“Our last deployment was this lady’s last dance, and it was a great one,” said *Portsmouth’s* Chief of the Boat, Master Chief Electronics Technician Daniel Adley. During the deployment that ended in February, the boat visited several ports, including cities in Japan, Singapore, and Hawaii.



Photo by PH1 David A. Levy

(above) EM1 Eric Cherry stands watch on the sail bridge as *Portsmouth* transits the Panama Canal.

(left) Mobile Security Detachment 22 (MSD-22), stationed at Naval Shipyard, Portsmouth, Virginia provides security for *Portsmouth* as she transits the Panama Canal.

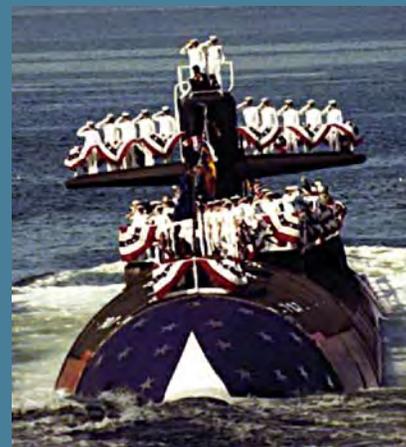
(right) *Portsmouth* Crewmembers leap into the waters of the Pacific Ocean during a swim call.



Photo by PH2 John Parker

## USS Portsmouth Serves with Distinction for More Than Two Decades

Serving for more than 20 years, USS *Portsmouth* conducted nine extended deployments and three mini-deployments. She was awarded six Meritorious Unit Commendations, the Silver Anchor Award for excellence in retention, the Engineering Red “E”, the Supply Blue “E”, five Battle Efficiency “E” awards, and a Navy Expeditionary Medal. In 1993, *Portsmouth* pioneered new methods of Special Warfare when she conducted an insertion of Army Rangers during a night joint exercise. On 6 June 2002, *Portsmouth* sank her one and only ship, ex-USS *Okinawa* (LPH-3) during a COMSUBPAC SINKEX off the southern coast of California.



*Portsmouth* launches in Groton, Connecticut on 18 September 1982

According to Adley, the crew of a submarine is often more cohesive than that of a surface ship because of the close quarters submariners live in. There isn't space on submarines for "Officers' Country," an area most surface ships set aside for the exclusive use of commissioned officers. Submarines also lack space for a "Chief's Mess," which means all enlisted Sailors eat together on the mess decks. On surface ships, senior enlisted Sailors eat in a separate area from their junior counterparts. Among the tight-knit submarine crews Adley has worked with during his 23 years in the service, he said *Portsmouth* is one of the best.

"This boat probably has the best chemistry of warriors I've ever experienced," he said. "It's been a blessing. We're all having fun, and that makes it much easier to put everything we've got into our jobs."

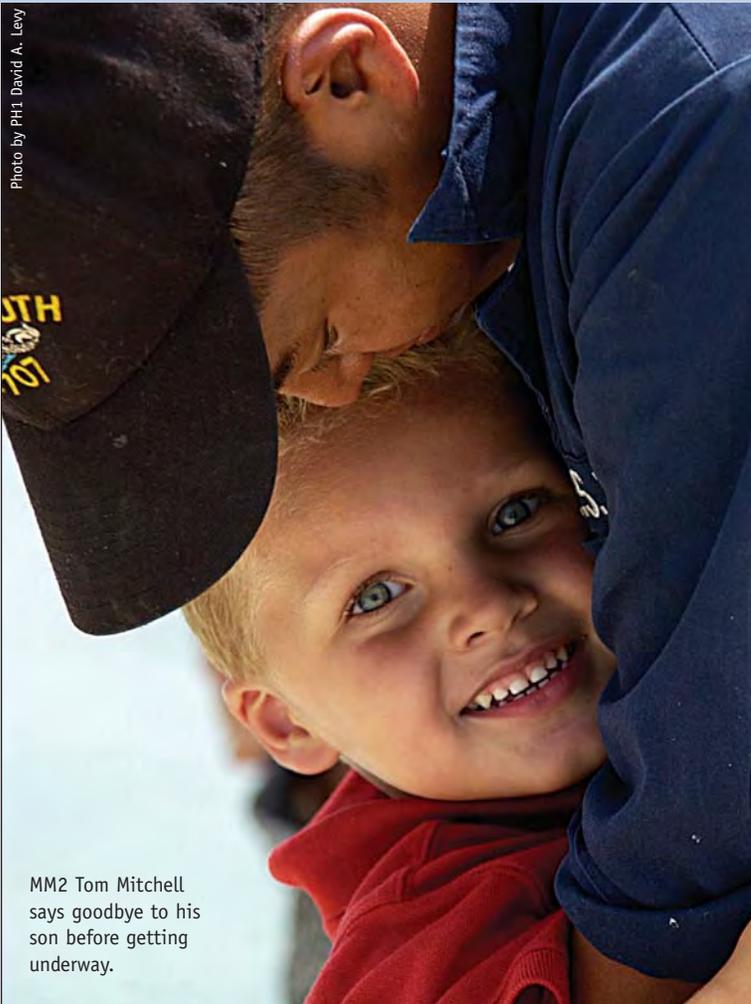
Although some of *Portsmouth's* Sailors will stay with their boat until the very end, others will start transitioning to new commands as early as October. Brenton said culinary specialists, sonar technicians, and other crewmembers with specialties not directly related to maintaining the boat's structure will be the first to leave. Nuclear technicians will be among the last.

Brenton said he considers the Sailors in his crew among the best and brightest young people in the United States today. He'd like America to know his Sailors have made many sacrifices in their personal lives to help their boat accomplish its missions out of dedication to *Portsmouth*, to the Navy, and to their country.

"Without the 160-or-so Sailors I have onboard, this boat is just a hunk of metal, wires, and hydraulic fluid," Brenton said. "They work with a sense of pride and professionalism that keeps me in awe everyday. Even though *Portsmouth* is going away, the Sailors will remain and bring that pride and professionalism to every ship they serve on in the future."

J01(SW)Leahy, Public Affairs Center San Diego

Photo by PH1 David A. Levy

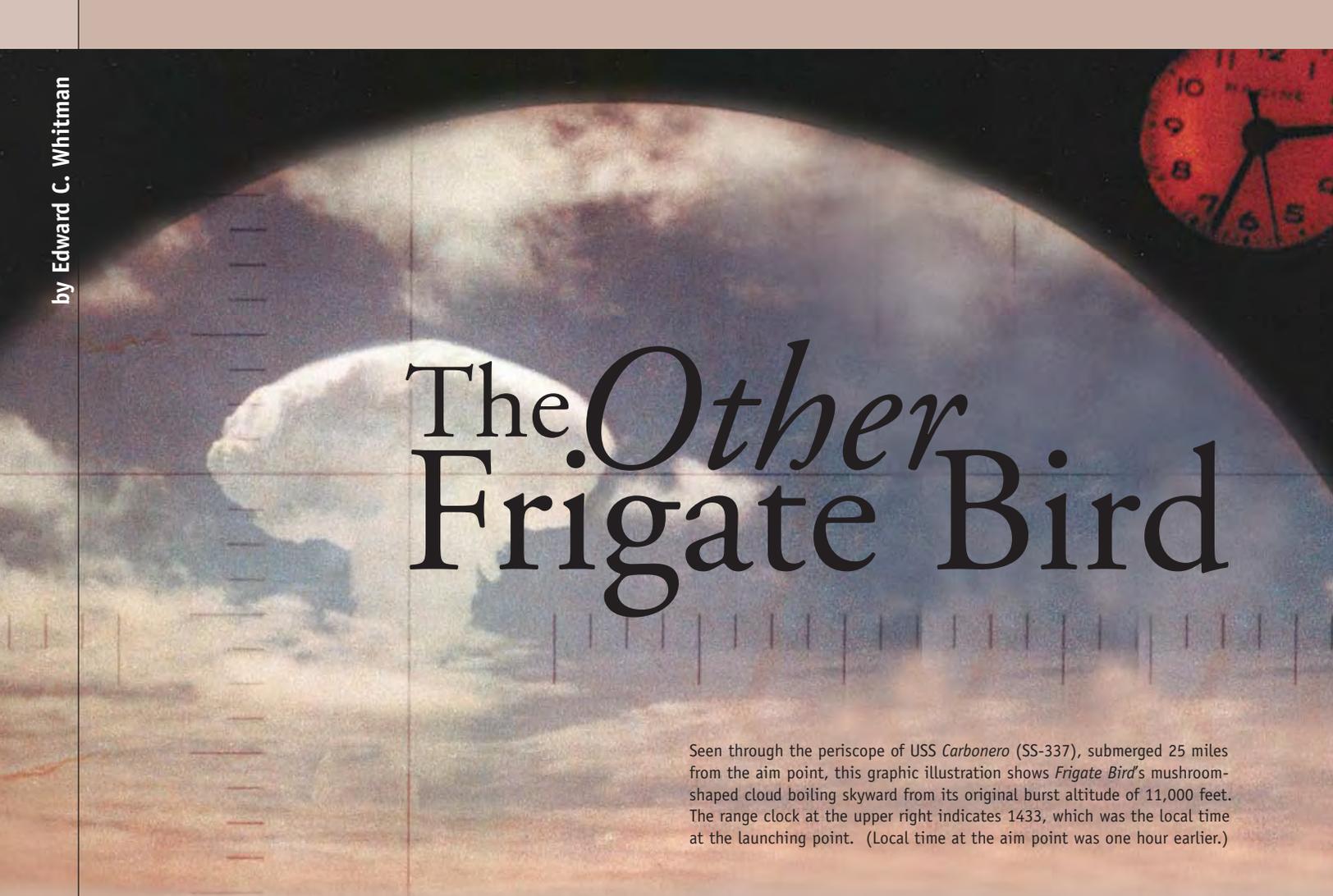


MM2 Tom Mitchell says goodbye to his son before getting underway.



Photo by PH1 David A. Levy

"This boat probably has the **best chemistry of warriors** I've ever experienced, it's been a blessing. We're all having fun, and that makes it much easier to put **everything we've got** into our jobs."



# The Other Frigate Bird

Seen through the periscope of USS *Carbonero* (SS-337), submerged 25 miles from the aim point, this graphic illustration shows *Frigate Bird's* mushroom-shaped cloud boiling skyward from its original burst altitude of 11,000 feet. The range clock at the upper right indicates 1433, which was the local time at the launching point. (Local time at the aim point was one hour earlier.)

The dictionary describes the frigate bird – sometimes called the man'o'war bird – as “any of several rapacious totipalmate sea birds of the genus *Fregata*, noted for their powers of flight.” Indeed with a wingspan up to 90 inches and the male's ability to inflate his bright-red pouch during courtship in a spectacular display, the frigate bird is a unique animal. Equally unique was a nuclear test of that same name conducted near Christmas Island in the Pacific during May 1962. Even now, the *Frigate Bird* test remains the only end-to-end system test of a strategic nuclear missile – from launch to detonation – ever carried out by either side during the Cold War. And the Frigate Bird Test was a Submarine Force demonstration, featuring a Polaris A-1 missile fired from USS *Ethan Allan* (SSBN-608).

## The First Nuclear Testing Moratorium

*Trinity*, the world's first nuclear explosion, took place in the New Mexico desert early on the morning of 16 July 1945, during the final months of World War II. Within another month, the two atomic bombs dropped on Hiroshima and Nagasaki had brought that conflict to a merciful conclusion, only to usher in the beginnings of a Cold War that eventually pitted the Soviet and western blocs against each other in a near-global confrontation. With President Truman's approval, the first peacetime nuclear weapon tests – Operation Crossroads – were mounted at Bikini Atoll in the Marshall Islands in July 1946, primarily to measure atomic weapon effects on warships. The second of these two

explosions – code-named *Baker* – produced one of the most memorable images of the towering mushroom-shaped cloud that became an icon of the nuclear age.

Three more nuclear tests followed at Enewetak Atoll in 1948, and by the time the Soviet Union detonated its first atomic bomb in August 1949, the United States had already exploded eight “devices,” including *Trinity* and the Hiroshima and Nagasaki bombs. As the Cold War deepened, the resulting nuclear competition accelerated rapidly and soon led to the development and testing of *thermo*-nuclear weapons (“hydrogen bombs”), first by the United States in October 1952, and then by the Soviets somewhat less than three years later. By mid-1958, the United States had conducted nearly 200 weapons tests, mostly at Enewetak and the recently established Nevada Test Site northwest of Las Vegas. Meanwhile, the Russians had accomplished at least 75 nuclear detonations.

On 22 August 1958, President Eisenhower – alarmed by the accelerating arms race and the possible environmental dangers of atmospheric testing – announced that if agreement were reached to begin meaningful negotiations on a nuclear test ban, the United States would observe a renewable unilateral moratorium on nuclear testing for at least a year. Soviet premier Nikita Khrushchev acquiesced, negotiations were duly initiated, and after one final test by each nation – within three days of each other two months later – no tests were conducted by either country for nearly three years.

On 1 September 1961, however, the Soviet Union “broke out” of the moratorium and scheduled 45 atomic weapon tests in 65 days, including the largest-ever nuclear explosion before or since – a 63-megaton hydrogen bomb. It was clear that the Soviet test series had resulted from long and careful preparation during a time when many of the corresponding U.S. test capabilities had been allowed to atrophy. Thus, on 5 September 1961, then-President John F. Kennedy reluctantly announced that U.S. nuclear weapons testing would have to resume, and 10 days later, the first of a new series of underground tests was implemented at the Nevada Test Site.

Even before the end of the moratorium, the U.S. atomic weapons community had begun to agitate for the resumption of atmospheric testing, and the Navy had already started contingency planning for systems tests of both the submarine-launched Polaris strategic missile and the ASROC surface-launched anti-submarine weapon, which in one variant carried a nuclear depth bomb. Additionally, the Air Force was anxious to conduct a similar systems test of an Atlas intercontinental ballistic missile from Vandenberg Air Force Base in California. In early November 1961, President Kennedy directed the Atomic Energy Commission and the Department of Defense to begin preparations for *atmospheric* testing, but it wasn't until early March 1962 that he formally announced his approval for a new series of open-air tests to commence late the following month.

The new test series, Operation Dominic, comprised 31 nuclear tests between late April and late October 1962. All but six took place in the vicinity of Christmas Island, then a British mandate in the Line Islands some 1,300 miles south of Hawaii.<sup>1</sup> Although the Navy had originally intended to conduct their Polaris and ASROC system trials in the Atlantic, with the Polaris target area near Ascension Island, both Navy tests were eventually rolled into Operation Dominic, which had been planned primarily as a series of air drops. The Polaris and ASROC tests were given the code names *Frigate Bird* and *Swordfish*, respectively, and became the fifth and ninth shots in the test sequence. For *Frigate Bird*, an impact area was selected northeast of Christmas Island, which served both as a communications and logistics hub and a base for the sampling aircraft that gathered technical data from the detonations.

### Implementing Frigate Bird

Specifically organized in November 1961 to carry out Operation Dominic, Joint Task Force 8 (JTF-8) was commanded by MAJ GEN Alfred Starbird, USA, of the Army Corps of Engineers, formerly the director for military applications at the Atomic Energy Commission. Under Starbird were Navy and Air Force military deputies and a civilian deputy for scientific affairs. The nuclear ASROC test was assigned to JTF-8 in mid-January 1962, but it was March before the Joint Chiefs of Staff granted final approval for the Polaris test. Moreover, the British had only agreed to the use of Christmas Island in early February, and an extraordinary logistics effort was needed to ready the base for the planned start of testing in late April. Ultimately, MAJ GEN Starbird designated his Navy deputy, RADM Lloyd Mustin, USN, as Commander, Joint Task Group 8.8 (JTG-8.8), charged specifically with executing *Frigate Bird* and *Swordfish*.<sup>2</sup>

The Navy had originally planned the Polaris system test for the Atlantic area, because at this early stage of the strategic submarine program, SSBN deterrent patrols had not yet been extended into the Pacific. Of the six SSBNs then operational, *Ethan Allen* – commanded by CAPT Paul Lacy, USN – was the newest, having been commissioned less than a year earlier, and she was designated as the firing ship.<sup>3</sup> The relatively late decision to transfer *Frigate Bird* to the Pacific created a challenging schedule problem, particularly since MAJ GEN Starbird and his staff wanted the two Navy tests executed as early as possible in the Dominic test series – i.e., during the first half of May.

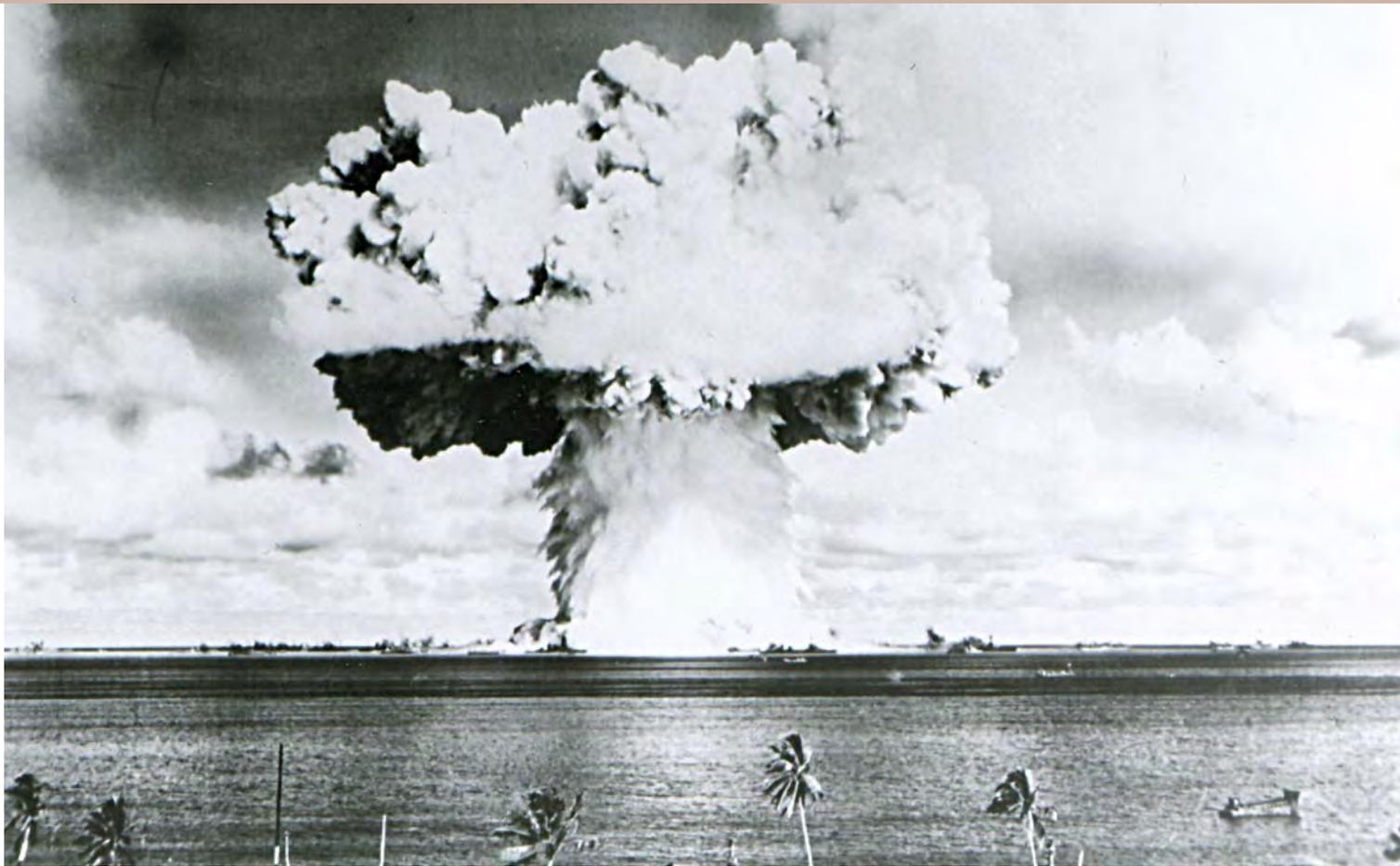


Launched at Electric Boat in November 1960, USS *Ethan Allen* (SSBN-608) was the sixth of the original “41 for Freedom” SSBNs. She had been in commission for less than a year when she was selected as the firing ship for *Frigate Bird*. *Ethan Allen* was eventually decommissioned in 1983 after a brief twilight career as an SSN.

## USS *Ethan Allen* (SSBN-608)

Launched at Electric Boat on 22 November 1960 as the sixth of the original “41 for Freedom” strategic ballistic missile submarines, USS *Ethan Allen* (SSBN-608) was commissioned in August 1961 and had only just completed her Post-Shakedown Availability when she was selected to be the firing ship for *Frigate Bird*. After returning to the Atlantic from Operation Dominic, *Ethan Allen* commenced her first deterrent patrol in late June 1962 and eventually completed 57 deterrent patrols before conversion to an SSN in September 1980. The ship was decommissioned in March 1983 and spent her final years at the Puget Sound Naval Shipyard, where her dismantling and nuclear recycling were completed in July 1999.

Because the first five U.S. SSBNs were actually built as a variant of the earlier USS *Skipjack* (SSN-585) configuration, *Ethan Allen* was the first submarine specifically designed for the strategic SSBN role. She displaced 6,900 tons surfaced and 7,900 tons submerged on a length of 410 feet, and in 16 vertical-launch missile tubes, she carried the Polaris A-1, A-2, and A-3 strategic ballistic missiles at various stages of her career. The ship was powered by an S5W pressurized-water reactor for an underwater speed of greater than 25 knots. Her complement was 12 officers and 128 enlisted men.



Accordingly, *Ethan Allen* hurriedly left Charleston, South Carolina on 19 April, four of her 16 standard Polaris missiles replaced by slightly modified weapons fitted with tracking beacons and command-destruct systems. The submarine passed through the Panama Canal and made a high-speed submerged transit to rendezvous on 2 May with surface units of TG-8.8 assembled at the firing point approximately 1,500 miles northeast of Christmas Island.

The firing and impact points had been selected with some care. Because the nominal range of the Polaris A-1 missile was approximately 1,200 miles, the launch point was chosen to be at least 1,300 miles from the nearest inhabited areas. Originally, this was expected to be near Johnston Island, approximately 1,400 miles northwest of Christmas Island, because Johnston was also an Operation Dominic hub, and logistic and test support would have been easier. However, with so little time available for *Ethan Allen* to reach firing position from the Panama Canal, CJTF-8 opted to launch from a point east of the target area. The intended nuclear detonation was to be an air burst at an altitude of 11,000 feet. Eye-safe considerations dictated that no uncontrolled observers could be within 150 miles of the explosion, which pushed the intended burst point northeasterly, away from Christmas and other islands of the chain. Ultimately, an aim point was selected 525 miles east-northeast of Christmas Island, just within the operating radius of the sampling aircraft staged from the airfield there.

In addition to *Ethan Allen*, TU-8.8 units in the vicinity of the launch point included the aircraft carrier USS *Yorktown* (CVS-10) with Carrier Air Group 55 embarked; the destroyers *Maddox* (DD-731), *Brush* (DD-745), *Samuel N. Moore* (DD-

(above) The first two nuclear detonations subsequent to the wartime atomic bombs at Hiroshima and Nagasaki comprised Operation Crossroads, conducted at Bikini Atoll in July 1946 to measure nuclear weapon effects on warships. This familiar image shows *Baker*, the second of the two tests, in which a 63-kiloton warhead was exploded 90 feet under water.

(below) Seen from an observing ship 120 miles away, the *Frigate Bird* fireball appears low on the horizon.



747), and *Preston* (DD-795); and the range safety ship, USS *Norton Sound* (AVM-1), in which RADM Mustin flew his flag. Downrange, the diesel-electric submarines USS *Carbonero* (SS-337) and USS *Medregal* (SS-480) were submerged at periscope depth 25 miles from the burst point and offset 45 degrees on either side of the flight path. The two observation submarines were equipped with both periscope cameras for visual documentation and so-called “bhangmeters” for measuring the warhead yield.<sup>4</sup> In addition, several measurement aircraft, flown from Christmas Island, were positioned to collect cloud samples and perform other diagnostic tests.

### Missile Away!

TF-8 had originally scheduled the *Frigate Bird* shot for 5 May, but dry runs with *Ethan Allen* on the 3rd and 4th revealed long-range communication problems between the launch area and Christmas Island. This setback necessitated delaying the firing a full day, by which time Pacific Fleet had assigned exclusive use of more reliable radio frequencies to the participants.

On the morning of 6 May, as the accompanying destroyers and the carrier’s air group performed range safety and security functions under the command of RADM Mustin on *Norton Sound*, *Ethan Allen* submerged to firing depth. Adverse weather in the impact area delayed the start of the initial countdown for approximately two hours – unfortunately after the missile safety systems had been switched to internal battery power. Finally, the countdown was started and had reached within 30 seconds of launching the primary missile, when the fire control system bypassed the first weapon because of a “muzzle hatch” limit-switch failure and cued up a second Polaris. The backup missile was also bypassed – because of a false “safe/ready” indication – and although both problems were easily correctable, RADM Mustin declared a range-safety hold to be sure that observation aircraft in the impact area were still correctly positioned. Then, just before the new launch time, the weather deteriorated in the firing area, and a further hold was imposed. By this time, the batteries in the onboard tracking-beacon and destruct systems of the first two missiles were running down, which necessitated replacing them before countdown could be resumed. But just as that procedure was getting underway, favorable cloud conditions materialized overhead, and the decision was quickly taken to fire the third of the four test missiles on hand. Following only a short delay caused by a minor hydraulic problem, *Ethan Allen* successfully launched this third weapon – somewhat after 1400 (launch-area time).<sup>5</sup>



The *Frigate Bird* test of a fully-armed Polaris missile took place in the east-central Pacific on 6 May 1962. The launching ship, USS *Ethan Allen*, was stationed 1,300 miles southeast of the Hawaiian islands and established an aim point some 1,100 miles away – 525 miles east-northeast of Christmas Island, from which most of the support efforts were staged.

Safety considerations demanded that the missile be “acquired” by the tracking system before it disappeared into the usual low-lying clouds. Thus, as soon as the Polaris broke the water, *Norton Sound* trained her tracking radars at the missile and locked on. As the weapon disappeared downrange, all indications were that the trajectory and flight time would fall within nominal limits: For a range of approximately 1,100 miles and an apogee of roughly 400 miles, flight time to the burst point was on the order of 12-13 minutes. Alerted by reports of the launch event, submarine and airborne observers in the target area readied their instruments.

At approximately 1330 local time in the sky above 4° 50’ North, 149° 25’ West, a brilliant, nuclear flash briefly overpowered the equatorial glare, followed quickly by a roiling fireball and a symmetrical mushroom-shaped cloud, suffused initially with a rosy glow. Surface observers 120 miles away saw the flash and then a half-minute long fireball several degrees above the horizon, about the size of a rising sun. As the debris cloud moved upward, the winds aloft gradually dispersed its compact structure as it drifted away to the east.



(far left) In this still image, from a motion picture taken to document the *Frigate Bird* event, the nuclear-armed *Frigate Bird* test missile clears the water shortly after launching from *Ethan Allen*.

(left) This movie still shows a planning conference onboard *Ethan Allen* shortly after she arrived in the firing area. RADM Lloyd Mustin, Commander, JTG-8.8, is second from the left.



## ASROC and Swordfish

The surface-launched Anti-Submarine Rocket (ASROC) became operational in 1961 in two variants – one carrying a parachute-retarded Mk 44 torpedo and the other a low-yield W-44 nuclear depth charge. ASROC's solid-fuel motor could loft either payload to a maximum range of approximately 10,000 yards.

Operation Dominic's *Swordfish* trial on 11 May 1962 was the only full service test of the nuclear-tipped ASROC missile, which was retired in 1989. Since the Christmas Island region was heavily fished by local natives, *Swordfish* was executed in an area some hundreds of miles southwest of southern California, where there had already been an underwater nuclear test – code-named *Wigwam* – in 1955. USS *Agerholm* (DD-826) was the firing ship, with USS *Richard B. Anderson* (DD-786) as a backup. *Agerholm* and *Anderson* were elements of Joint Task Group 8.9 (JTG-8.9), to which – following *Frigate Bird* – RADM Mustin was brought by *Yorktown*, where he shifted his flag to USS *Monticello* (LSD-35), the *Swordfish* command/support ship. In addition to a five-mile floating array of shock and acoustic sensors streamed from *Monticello*, two “target ships” were positioned to measure weapon effects – the unmanned destroyer USS *Bausell* (DD-845) just over a mile from the aim point; and the fully manned diesel-powered submarine USS *Razorback* (SS-394) at periscope depth 4,000 yards from “surface zero.”

Originally planned for 10 May, the *Swordfish* test was delayed for a day by a cloud ceiling that prevented aerial photography. However, at 1300 on the 11th, *Agerholm* successfully fired a nuclear ASROC at an instrumented target raft 4,000 yards down range. After some 40 seconds of flight and sinking time, the weapon detonated at an undisclosed depth and produced both a powerful shock wave and a prodigious water plume and base surge fully captured on film. The resulting data was used to formulate tactical doctrine for ASROC and to refine the Navy's understanding of underwater weapon effects on both platforms and sensors.

*Swordfish*, the only full-service test of a nuclear-tipped ASROC missile, took place on 11 May 1962 several hundred miles southwest of southern California. In the foreground of this photograph of the spectacular underwater burst that resulted is the firing ship, USS *Agerholm* (DD-826), standing off at a range of only 4,000 yards.

### The Aftermath

Subsequent analysis of the recorded data and cloud samples taken by Air Force B-57 Canberra aircraft revealed that the air burst took place 1.25 miles from the nominal aim point and that the Polaris W-47 thermo-nuclear warhead performed up to expectations, with a yield in the 600-kiloton range.<sup>6</sup> Five days later, the destroyer USS *Agerholm* (DD-826) executed *Swordfish* by launching a nuclear-armed ASROC into a well-instrumented test area 370 miles southwest of San Diego. The resulting underwater detonation was even more spectacular than *Frigate Bird*. [See sidebar.]

If any adversary had doubted the credibility of the sea-borne leg of the nation's nuclear triad before, the Navy's end-to-end Polaris test in May 1962 certainly eliminated any remaining uncertainty. In vectoring *Ethan Allan* so quickly to the Pacific and demonstrating convincingly that a front-line submarine – loaded out with standard operational missiles – could execute its strategic mission on short notice, the Submarine Force struck a solid blow for nuclear deterrence. A full-system, strategic-weapon test had never been done before, and because the Limited Test Ban Treaty among the United States, the Soviet Union, and the United Kingdom ended atmospheric testing by those three nations only a year later, it was never done again.<sup>7</sup>

Dr. Whitman is a former Senior Editor of UNDERSEA WARFARE Magazine and continues to be a contributing editor.

### Bibliography:

Light, Michael, *100 Suns – 1945-1962*, Alfred P. Knopf, New York, 2003.

Ogle, William E., *An Account of the Return to Nuclear Weapons Testing by the United States after the Moratorium 1958-1961*, U.S. Department of Energy-Nevada Operations, Report NVO-291, October 1985.

U.S. Department of Energy-Nevada Operations, *United States Nuclear Tests, July 1945 through September 1992*, Report NVO-209, Rev. 15, December 2000.

U.S. Department of Energy-Nevada Operations, *Pacific Nuclear Tests – 1962*, VHS video tape # 0800043.

- 1 As part of the Republic of Kiribati, established in 1979, Christmas Island is now called Kiritimati. Readers are cautioned that there is *another* Christmas Island – an Australian territory – in the eastern Indian Ocean just south of Java.
- 2 General Starbird's scientific deputy was Dr. William Ogle, whose now-declassified report on the resumption of U.S. nuclear testing in 1961-62 is an authoritative account of these events.
- 3 It is certainly worth noting that *Frigate Bird* took place less than two years after the first successful underwater launch of a Polaris missile from USS *George Washington* (SSBN-598) in July 1960.
- 4 A “bhangmeter” is an optical measuring device that determines the time interval from the first of the two peaks of the characteristic visible light signature of a nuclear detonation to the minimum between them. This brief period is related loosely to the warhead yield – more time, more yield – and has been used to provide a rough estimate of the latter. As a reflection of the disdain then felt for this methodology by some members of the scientific community, the root-word “bhang” is a kind of Indian hemp which is smoked for its hallucinogenic properties.
- 5 Navy authorities were at great pains to explain that in a real-world situation, none of these delays would have had tactical significance, because each of the problems was resolved quickly. *Frigate Bird*'s experimental protocol, however, required that timing and observation conditions be near optimum.
- 6 However, at least one source – Ogle's report – claims a burst altitude of 8,300 feet, vice the “official” figure of 11,000, a curious discrepancy.
- 7 Irreconcilable safety concerns prevented approval of the proposed U.S. Air Force test of an Atlas intercontinental ballistic missile from Vandenberg AFB or from a deployed ICBM silo in the U.S. heartland. Subsequently, France, China, India – and possibly South Africa – also conducted atmospheric tests, but the last of these explosions seems to have been staged by China in 1980, and none involved operational missiles.



## Line Officer Qualified In Submarines

LTJG Jeff Ammon  
USS Alabama (SSBN-731) (B)

LTJG Taniel Anderson  
USS Nevada (SSBN-733) (G)

LTJG Aaron Berry  
USS Nevada (SSBN-733) (G)

LTJG Jeremy Biediger  
USS Alaska (SSBN-732) (G)

LTJG Todd A. Bowie  
USS Providence (SSN-719)

LTJG Michael F. Bradley  
USS West Virginia (SSBN-736) (B)

LT Karl Brown  
USS Columbia (SSN-771)

LTJG Christopher Bryan  
USS Henry M. Jackson (SSBN-730) (B)

LTJG Michael Cataffo  
USS Honolulu (SSN-718)

LTJG Kenneth T. Cooke  
USS Boise (SSN-764)

LTJG Andrew Crawford  
USS La Jolla (SSN-701)

LTJG John Desantis  
USS Georgia (SSGN-729)

LTJG Jeffrey Degroot  
USS Connecticut (SSN-22)

LTJG Adam Driessen  
USS Asheville (SSN-758)

LTJG Daniel R. J. Estes  
USS Scranton (SSN-756)

LTJG David W. Fassel  
USS West Virginia (SSBN-736) (B)

LTJG William A Girdler  
USS Scranton (SSN-756)

LTJG Jordan P. Glassman  
USS Oklahoma City (SSN-723)

LTJG Kenneth M. Grassia  
USS Montpelier (SSN-765)

LTJG Johnathon E. Greives  
USS Wyoming (SSBN-742) (G)

LTJG Justin Hendrix  
USS Honolulu (SSN-718)

LTJG Roderick Hodges  
USS Key West (SSN-722)

LTJG Daniel W. Hudson  
USS Oklahoma City (SSN-723)

LTJG Eric Hunter  
USS Santa Fe (SSN-763)

ENS Chen Jiang  
USS Michigan (SSGN-727)

LTJG Michael Kolodner  
USS Henry M. Jackson (SSBN-730) (B)

LTJG Douglas Kroll  
USS Michigan (SSGN-727)

LTJG Lindwood O. Lewis  
USS Maryland (SSBN-738) (G)

LTJG Matthew Maclean  
USS Tucson (SSN-770)

LTJG Michael A. Masoner  
USS Rhode Island (SSBN-740) (B)

LTJG Erik Nelson  
USS Nevada (SSBN-733) (G)

LTJG Eric W. Olendorf  
USS Oklahoma City (SSN-723)

LTJG James O'malley  
USS Nevada (SSBN-733) (G)

LTJG David Pfaefflin  
USS Nevada (SSBN-733) (G)

LTJG Joshua D. Powers  
USS Providence (SSN-719)

LTJG Travis J. Rosser  
USS West Virginia (SSBN-736) (B)

LTJG Brian Sherriff  
USS Alabama (SSBN-731) (B)

LTJG Thomas Spahn  
USS Chicago (SSN-721)

LTJG Daniel B. Sowder  
USS Maryland (SSBN-738) (G)

LTJG Daniel R. Stock  
USS Scranton (SSN-756)

LTJG Matthew Sullivan  
USS Tucson (SSN-770)

LTJG Adam J. Thomas  
USS Montpelier (SSN-765)

LTJG Jason Tuthill  
USS Columbia (SSN-771)

LTJG Thomas Weiler  
USS Chicago (SSN-721)

LTJG Matthew Willet  
USS La Jolla (SSN-701)

LTJG Kyle C. Welshans  
USS Wyoming (SSBN-742) (G)

LTJG Kristofer Westphal  
USS Asheville (SSN-758)

LTJG Frederick Weisbrod  
USS Henry M. Jackson (SSBN-730) (B)

## Chief Warrant Officer Qualified In Submarines

CWO2 Dana Wynn  
USS Henry M. Jackson (SSBN-730) (B)

## Limited Duty Officer Qualified In Submarines

ENS Bryan Kupyar  
USS Ohio (SSGN-726)

## Supply Corps Officer Qualified In Submarines

LTJG Josh A. Elston  
USS Scranton (SSN-756)

ENS Anthony Harper  
USS Nevada (SSBN-733) (G)

LTJG Peter Holdorf  
USS Alabama (SSBN-731) (G)

LTJG Timothy Mark  
USS Honolulu (SSN-718)

## Undersea Medical Officer Qualified In Submarines

LCDR Luis Marquez  
NSSC Bangor

Photo by PH3 Todd Frantom



## Submariners Brave a Wilderness Challenge

Two Sailors assigned to the Naval Submarine Torpedo Facility, Yorktown, Virginia maneuver their "Duckie" whitewater boat down the rapids during the annual joint-service Wilderness Challenge in West Virginia. Military teams from all the armed services compete in events such as an eight-kilometer mountain run, a 13-mile whitewater raft race, a seven-mile Duckie race, and a 14-mile mountain hike for the honor of taking home the first-place trophy.



## Changes Of Command

COMNAVSUBFOR  
VADM Charles L. Munns, relieved  
VADM Kirkland Donald

COMSUBRON Three  
CAPT L. David Marquest relieved  
CAPT William J. Toti

USS Greenville (SSN-772)  
CDR Lorin Selby relieved  
CDR Lee Hankins

COMSUBRON One  
CAPT Michael A. Zeiser relieved  
CAPT Cecil D. Haney

USS Chicago (SSN-721)  
CDR Richard Wortman relieved  
CDR Craig Selbrede

COMSUBRON-19  
CAPT Derek H. Hesse relieved  
CAPT Robert E. Schuetz

COMSUBGRU-7/CTF54/CTF 74  
RADM David A. Gove relieved  
RADM John J. Donnelly

USS Pasadena (SSN-752)  
CDR Donald C. Fritts, Jr. relieved  
CDR John P. Heatherington

USS Cheyenne (SSN-773)  
CDR Richard J. Testyon relieved  
CDR Charles J. Doty

## Qualified For Command Of Submarines

LCDR Sean Findlay  
USS Pasadena (SSN-752)

LCDR Andrew D. Gainer  
USS Florida (SSGN-728)

LCDR Shawn Huey  
USS Portsmouth (SSN-707)

LCDR Anthony Moore  
USS Georgia (SSGN-729)

LCDR Christopher A. Nash  
USS Montpelier (SSN-765)

LCDR Steven Speight  
USS Kentucky (SSBN-737) (B)

## Supply Corps Officer Qualified In Submarines

LTJG Josh A Elston  
USS Scranton (SSN-756)

ENS Anthony Harper  
USS Nevada (SSBN-733) (G)

LTJG Peter Holdorf  
USS Alabama (SSBN-731) (G)

LTJG Timothy Mark  
USS Honolulu (SSN-718)

## The Submarine Reserve Serve as Dynamic Partners with the Fleet

*continued from page 12*

These reservists are key in spreading the Navy's story – and particularly our submarine story – across the country. Our submarine reservists are ready on a daily basis to step up and meet the challenge.”

### The Way Ahead for the Submarine Reserve

Under the current transformation process embodied in the CNO's Sea Power 21 vision, the focus of the submarine reserve will remain fixed on the Navy's present and future missions, and it will continue to evolve and adapt to change. Developing effective organizations and enhancing our specific capabilities will be critical. With the Zero Based Review (ZBR) and the alignment of the active-duty and reserve components, the reserve will focus more on mission capabilities and not just names on a muster list – as some will admit often occurred during the Cold War.

Forward-looking Sailors in the submarine reserve will continue to expand and improve their skills. As these capabilities grow, so will the missions assigned to us and the depth of our relationship with the active-duty force. “We are also expanding further into submarine rescue, strike-group operations, and tactical development and experimentation for the SSGN conversions,” said RADM Beebe. The submarine reserve's way ahead is to continue to provide viable, relevant, operational, and mission support to the fleet. We will ensure that our people are ready to answer the call, developing their skills in accordance with Sea Warrior and building out the Five Vector Model for ratings within the force. “The submarine reserve is ready to serve and will continue its ‘Support to the Fleet... Ready and Fully Integrated,’” said VADM Cotton. “It's not the Naval Reserve, it's the Navy.”

“We depend on the Navy; and the Navy depends on us,” reflected RADM Beebe.

LT Patrick Mallet is the Public Affairs Officer for Navy Reserve COMSUBLANT Detachment 306.

## NUWC: Not Just Another REORG

*continued from page 9*

Finally, there are new Communities of Practice – formal networks of employees with common skills, work areas, or functions. We believe that these groups will foster cross-department/cross-divisional communication, identify best practices, and disseminate lessons-learned quickly and effectively, promoting a more robust and sustainable knowledge-management process for the command. If properly supported, these Communities of Practice can significantly improve our productivity and efficiency by minimizing the waste of re-learning “other peoples' lessons” and by identifying and promoting better ways of doing business. To paraphrase one of our current Navy leaders, “it's far better to have someone go ‘steal’ a good practice and implement it immediately than it is to waste time and resources developing a better one.”

### No, It's Not Just Another “Reorg”

Although many things are changing at NUWC, rest assured that we hold some key things dear, and we are strongly committed to ensuring they don't change – the safety of our products, the quality of our workmanship, the talents of our people, and our guiding principles of accountability, respect, teamwork, initiative, and integrity. These are not negotiable.

On the other hand, the transformation taking place at NUWC is substantial and signals a new way of doing our business. Not only have we revised or realigned many of the fundamental processes used to plan and execute our work, but perhaps more significantly, we have begun to see it reflected in our underlying culture. No, this really isn't just another person's desire to shuffle the deck chairs, and it won't be “business as usual” when our current crop of leaders move on. I have already seen clear evidence that positive change is taking place and that it's permanent. I'm encouraged and excited about the potential it brings.

CAPT Mickey is Commander of the Naval Undersea Warfare Center Division, Newport.

## Qualified Nuclear Engineer Officer

LTJG Kenneth Baker  
USS Bremerton (SSN-698)

LTJG Allan Bemis  
USS Honolulu (SSN-718)

LT Bryan Burke  
USS Santa Fe (SSN-763)

LTJG Dean Chen  
USS Houston (SSN-713)

LTJG Christopher Gregson  
USS Alabama (SSBN-731) (G)

LTJG Steven Grossman  
USS Greenville (SSN-772)

LTJG Joel Hartel  
USS Kentucky (SSBN-737) (B)

LTJG Christopher Hedrick  
USS Cheyenne (SSN-773)

LTJG George Howell  
USS Henry M. Jackson (SSBN-730) (B)

LTJG Ronald Ibbetson  
USS Jefferson City (SSN-759)

LT Quintin James  
USS City of Corpus Christie (SSN-705)

LTJG Tyler Johnson  
USS Louisville (SSN-724)

LTJG Pratik Joshi  
USS La Jolla (SSN-701)

LTJG Horacio Larios  
USS Greenville (SSN-772)

LTJG Ethan Lee  
USS Asheville (SSN-758)

LT Matthew Myers  
USS City Of Corpus Christi (SSN-705)

LTJG Michael Monaghan  
USS Los Angeles (SSN-688)

LTJG Trent Neville  
USS Henry M. Jackson (SSBN-730) (B)

LTJG Chad Roum  
USS Alabama (SSBN-731) (B)

LTJG Michael Vodehnal  
USS San Francisco (SSN-711)

LTJG Jonathan Ward  
USS Michigan (SSBN-727) (B)

LTJG Thomas Weiler  
USS Chicago (SSN-721)

LT Glenn Welling  
USS Santa Fe (SSN-763)

LTJG Thomas Woodward  
USS Asheville (SSN-758)

## Dear Editor,

I read the Spring 2004 issue today while doing Docent duty on USS *Pampanito* (SS-383), the museum submarine in San Francisco. I am a former submariner having served on USS *Torsk* (SS-423), USS *Andrew Jackson* (SSBN-619)(G) and USS *Tecumseh* (SSBN-628)(B) from 1963 to 1969.

The article on Tom Nutter on page 11 was of particular interest since I served with him on USS *Torsk* during the period 1963 to 1965. I would like to personally add my congratulations to him in recognition of his outstanding service.

**Eric Schaefer, LT, USN (Ret.)**

As a 1st Class STS, it was good to see an article applauding the top-notch personnel that run the ACINT program. The knowledge and experience that these men bring to the submarine fleet surpasses anything the average sonarman would learn from a book. I hope that this program continues on as long as there is a submarine fleet. Thank you to all those people that are willing to give their lives to ensuring that the US Navy maintains its undersea superiority.

**STS1/SS Williams**  
Naval Base Point Loma, San Diego

I particularly enjoyed the historical articles on WWII supply missions and loss of S-5. Note that Savvy Cooke lost his boat but was exonerated, stayed in subs, and ultimately made admiral. Some contrast to the current practice where COs are summarily relieved because of a superior officer's "loss of confidence."

One nitpick for "Saviors and Suppliers" by Thomas Holian re: caption of Narwhal photo on page 25. Narwhal was modernized between December 1942 and April 1943, as part of which she received four brand new GM 16-278A "top of the line" engines, so they could hardly have been "ancient and rickety" as described.

**John Alden, CDR, USN (Ret.)**

*CDR Alden,*

*Thank you for your feedback. As you have correctly pointed out, Narwhal had received a badly needed overhaul by early 1943. As part of the overhaul, her "ancient and rickety" M.A.N. engines were replaced by GM 16-278A engines at that time. As you note in "The Fleet Submarine in the U.S. Navy," these were rated at 1,600 horsepower at 750 revolutions per minute.*

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. Please include pertinent contact information with submissions.

Send submissions to:  
[underseawarfare@navy.mil](mailto:underseawarfare@navy.mil)

or

Military Editor

Undersea Warfare CNO N77  
2000 Navy Pentagon  
Washington, DC 20350-2000



# Some Thoughts from a Seasoned Submariner

by CAPT Steven I. Struble, USN

I'm still enrolled in the school of hard knocks. And I expect that, like most of us, my graduation certificate will be issued concurrently with my death certificate. While I do not yet consider myself to be a "gray beard" either literally or figuratively, I think I have been a submariner at least long enough to believe that the lessons I've learned in this school are worth sharing. For as the old adage goes: *Wisdom comes from reflecting on the compilation of life's many mistakes.* So here for your consideration are seven of the more important lessons I've learned in the "school of life." They're geared toward the officer who aspires to command at sea, but they should have applicability to any submariner in a leadership position.

First, **be cautiously optimistic.** Optimism is contagious and contributes to morale, enthusiasm, and ultimate success. However, excessive and undue optimism clouds one's vision and obscures the pitfalls. A healthy dose of caution can provide an effective counterbalance. There are usually snakes out there in that beautiful meadow somewhere, and they must be found and eliminated before they bite.

Next, **all of us together are smarter than any one of us alone.** Like most people, I consider myself to be pretty smart. But I can't think of any significant problem where my idea for the best solution wasn't improved with help from my shipmates. If you chose to go it alone, you may succeed. But only through teamwork will you truly excel.

This next thought is tied tightly to the previous one. **If you want confident backup, keep your mouth shut.** This realization gradually entered my mind as I rose through the ranks. When a senior officer speaks – presumably with superior wisdom – subordinates accept his words, have confidence that a solution is at hand, and move on to the next problem. They tend not to question or challenge the appropriateness of the "professional" answer. So to get effective backup – and greater teamwork – the senior is well advised to resist the urge to pontificate to his utmost.

**Don't just ask "what?" Go on to assess "so what?" and "now what?"** We seem to have this cultural fixation with status reports. They come in many forms – after-watch reports, duty-officer calls, department-head meetings, training records, audit and surveillance reports, and so forth. But a common shortfall is that the "what" is all we tend to focus on. While factual situational awareness is a good and necessary thing, we also ought to be asking "so what?" to put the current status into context, and then asking "now what?" to make better decisions and improve our procedures. I often draw a fire control analogy when explaining this concept. Plotting dots answers the "what." But not much happens

if that's all we do. Measuring and assessing bearing rate from the dots gets us to "so what," and then maneuvering the ship responsibly is taking action on the "now what."

These first four ideas generally speak to leadership. Now, here are three more geared toward operations. We modern submariners can tend to "nuke things out" to a fault. Hence, we need to **fully understand the assumptions behind any thumb rule.** We use thumb rules in many areas of our profession. But they are all based on assumptions and have pluses or minuses associated with them. So, if we do not *fully understand* the latter, they can get us into trouble. As a simple example: do you really appreciate the difference between  $t$  and  $t^*$  in calculating Ekelund ranges? If not, stand by to get run over!

**Innovation is good. Standardization is good. Find the balance.**

Operationally, this is related to my claim above that all of us together are smarter than any one of us alone. We must innovate in order to transform – *had to get that T-word in here somewhere!* Without innovation, we stagnate, and the world passes us by. But can we possibly think that a successful new way of doing business is good only for our ship, only for our crew? I think we do a great disservice if we come up with a brilliant idea and don't share it with the rest of the force. Or more dangerously, come up with a "brilliant" idea that unknowingly puts our crews at risk. So think great thoughts, then share them!

Finally, **procedural compliance is good, but only when the procedure applies.** The unfortunate alternative is "blind procedural compliance." To put this in perspective, we must understand that – like thumb rules – our procedures have myriad assumptions and initial conditions behind them. In reverse engineering any given procedure, you can probably devise a credible situation where that procedure, as written, is *not* the optimum course of action. The challenge is to know the basis of each one well enough to recognize the assumptions before you follow it blindly, right into trouble.

These thoughts have been developing in my mind over many years, and I routinely try to put them to use. I hope that my committing them to paper stimulates your own thoughts and contributes constructively to the Submarine Force. As I've stated above several times, all of us together are really smarter than any one of us alone!

CAPT Struble is currently posted as Commander, Submarine Squadron 20, in Kings Bay, Georgia. He has served in a number of assignments within the Submarine Force, including command of USS *Tennessee* (SSBN-734) and as Senior Member of the Atlantic Fleet Nuclear Propulsion Examining Board.





## USS Toledo Visits Kingdom of Bahrain



Photo by PH1 David C. Lloyd

(above) Crewmembers assigned to the *Los Angeles*-class attack submarine, USS *Toledo*, scan for contacts after leaving port in the Kingdom of Bahrain.

(below) MMF Ricky Andes mans the helm as he steers the *Toledo* through the shallow waters of the Arabian Gulf, while the Diving Officer of the Watch, TMSC Eric Mathley and the planesman, ET3 Michael Wheeler, look on.



Photo by PH1 David C. Lloyd

USS *Toledo* (SSN-769), an element of the USS *John F Kennedy* (CV-67) Carrier Strike Group (CSG), recently completed a 10-day port visit to the Kingdom of Bahrain. In addition to allowing some much-needed shore leave, the ship seized that opportunity to perform a mid-deployment upkeep.

Additionally, *Toledo* completed a month-long Composite Training Unit Exercise (COMPTUEX) with the *Kennedy* CSG. COMPTUEX is a multiphase, intermediate-level training exercise, designed to forge ships in *Kennedy* CSG into a cohesive fighting team. In phase one, the strike group learned to operate together against individual surface, air, and sub-surface threats. During phase two, the strike group exercised against simultaneous, multiple threats.

*Toledo* is currently on a scheduled deployment in support of the sovereign Iraqi government.

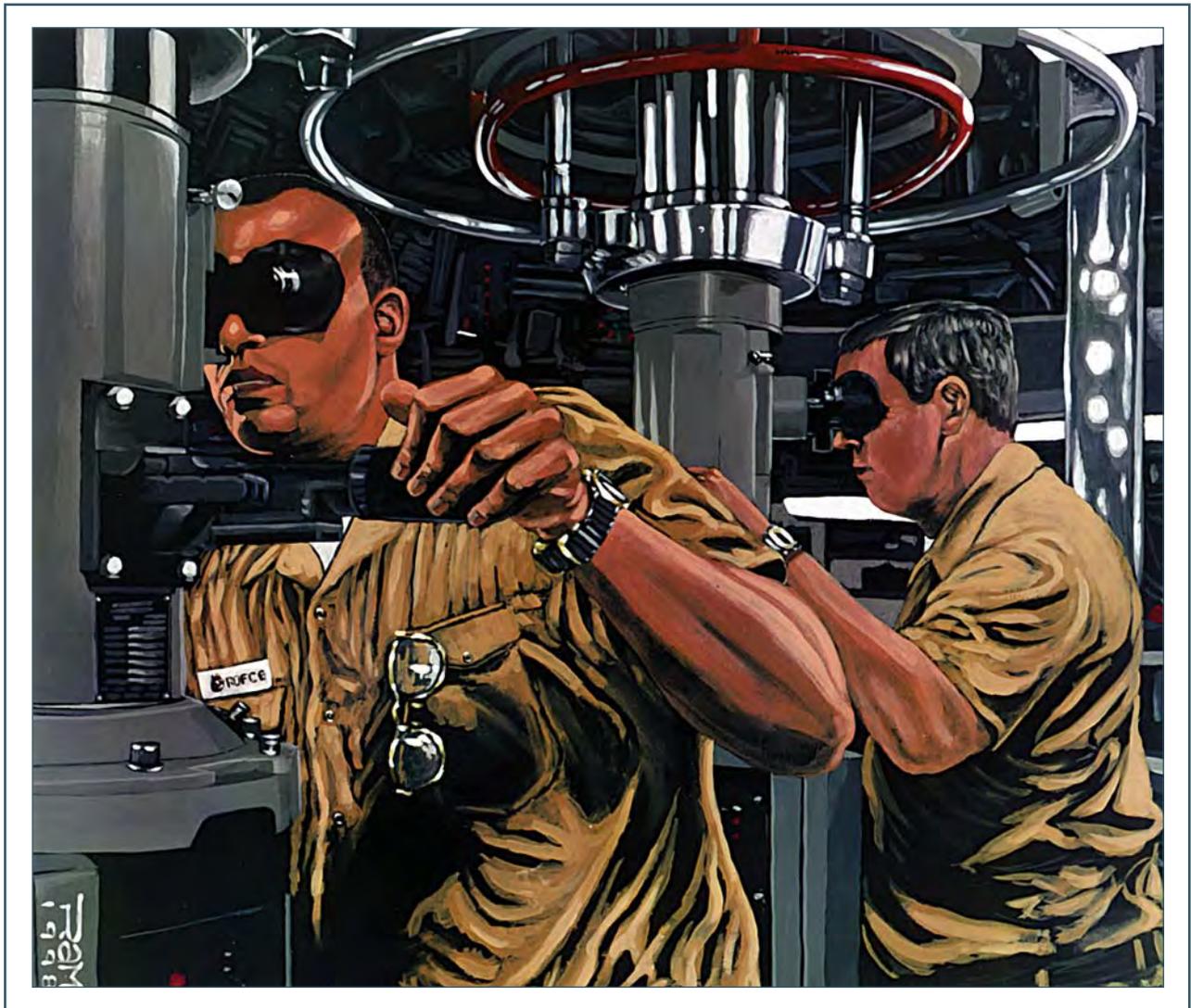
### On The Back



**"Up Periscope"** by Illustrator Draftsman 2nd Class Robert Malin. In 1998, official Navy Artist DM2 Malin was assigned to record the U.S. Navy's role in RIMPAC 98, the biannual fleet exercise in the Pacific Ocean. The exercise's goal is to enhance the tactical capabilities of participating units in major aspects of maritime operations at sea. In 1998 the exercise took place in the waters off Hawaii and included participants from six Pacific nations. The U.S. contributed more than 50 ships, 200 aircraft, and 25,000 military men and women from all services. To learn more about the evolution of periscopes such as those in this painting, see "Eyes from the Deep: A History of U.S. Navy Submarine Periscopes" on page 16.

DM2 Malin, a self-taught artist with no formal training, was born in Tauranga, New Zealand to an American father and British mother. DM2 Malin enlisted in the Navy one week after coming to the United States in 1993. His previous assignments include USS *Frank Cable* (AS-40), USS *Detroit* (AOE-4), and Naval Submarine Base Kings Bay.





## “Up Periscope”

By Illustrator DM2 Robert Malin.