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# *The Silent Sentinel*

November 2009



### *Our Creed*

To perpetuate the memory of our shipmates who gave their lives in the pursuit of their duties while serving their country. That their dedication, deeds, and supreme sacrifice be a constant source of motivation towards greater accomplishment and patriotism to the United States of America and its Constitution.



*Black Tie on the Midway, Subvets Convention 2009*

# U.S. Submarine Veterans San Diego Base

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## The Silent Sentinel via Email

To all of my Shipmates and families who currently receive our Great newsletter via the mail who would like it sent via email or continue to receive it via mail, please fill out the form and mail it to the base or myself. We are trying to cut the cost of the newsletter down from \$3700 to about \$1900 a year. By receiving the Silent Sentinel via email will cut down the printing and mailing cost. The other plus to receiving it via email is you can save it on your computer and not have the paper lying around the house.

*A subscription to the Silent Sentinel newsletter will be available to surviving family members via internet email, at no charge, upon notification of the Membership Chairman. If a printed hard-copy is preferred, via US Post Office delivery, an annual donation of \$5.00 will be requested to cover costs.*

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY/STATE/ZIP: \_\_\_\_\_

EMAIL: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

Would like the SILENT SENTINEL emailed: YES \_\_\_\_\_ NO \_\_\_\_\_

Robert Bissonnette  
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USSVI Base Commander  
c/o VFW Post 3787  
4370 Twain Ave.  
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*DUE TO LOGISTICS CONSTRAINTS, ALL INPUTS FOR THE SILENT SENTINEL MUST BE IN MY HAND NO LATER THAN **ONE WEEK** AFTER THE MONTHLY MEETING. IF I DO NOT RECEIVE IT BY THIS TIME, THE ITEM WILL NOT GET IN. NO EXCEPTIONS! MIKE*

### **November Meeting**

Our monthly meetings are held on the second Tuesday of the month at VFW Post 3787, 4370 Twain Ave., San Diego. Our November meeting will be on 10 November, 2009. The post is located one-half block West of Mission Gorge Road, just north of I-8. The meeting begins at 7 p.m. The E-Board meets one hour earlier at 6 p.m.

*Check us out on the World Wide Web*  
**www.ussvisandiego.org**

### **BINNACLE LIST**

*Mike Hyman* (recuperating at home)

*C J Glassford* (recuperating at home)

*Dick Fullen*, unfortunately is back in the Nursing Home with Pneumonia. Seems to be doing OK, but is no longer recuperating at home. Can be visited/called at: Villa Monte Vista, 12696 Monte Vista, Poway, Ca 92064, 858-487-6242, Room 119. Dick's wife said he'd be pleased to see/hear from any of us.

*Tom Warner's wife Sherry* is doing very well and walking two and one-half miles each day.

Submitted by Mike Hyman

### **Submarine Losses in October**

Submitted by C J Glassford



- S-37 (SS 142) - 43 Men on Board:  
 Battery Explosion, on 10 Oct 1923, in the San Pedro Harbor, California : "3 MEN LOST"
- O-5 (SS 66) - 33 Men on Board:  
 Rammed and Sunk, on 20 Oct 1923, by the United Fruit Steamer, "ABANGAREZ", in Limon Bay, Canal Zone:  
 "3 MEN LOST"
- S-44 (SS 155) - 56 Men on Board:  
 Sunk, on 7 Oct 1943, by a Japanese Destroyer, Northeast of Araitto Island, off Amchitka :  
 "FIFTY FOUR MEN LOST - TWO SURVIVORS"

**WAHOO (SS 238) - 80 Men on Board:**

Sunk, on 11 Oct 1943, by Japanese Naval Aircraft, Submarine Chasers, and Minesweeper, In La Perouse Straits, off Japan :  
“ALL HANDS LOST “

**DORADO (SS 248) - 76 Men on Board:**

Sunk, on 13 October 1943, Cause Unknown, Either Accidentally Bombed and Sunk by Friendly Fire of Guantanamo Based Flying Boat, or Sunk by German Submarine Mine, in the West Indies :  
“ALL HANDS LOST “

**SEAWOLF (SS 197) - 99 Men on Board, Plus 17 Army Personnel:** Accidentally Sunk, on 3 Oct 1944, by US Naval Aircraft from the USS MIDWAY (CV 63), and USS ROWELL (DE 403), off Morotai Island: “ALL HANDS LOST “

**ESCOLAR [ Bell] (SS 294) - 82 Men on Board:**

Possibly Sunk, on 17 Oct 1944, by a Japanese Mine in the Yellow Sea:  
“ALL HANDS LOST “

**SHARK # 2 [Bell] (SS 314) - 87 Men on Board:**

Sunk, on 24 Oct 1944, by Japanese Depth Charges, in South China Sea, West of Luzon :  
“ALL HANDS LOST “

**DARTER (SS 227) - 71 Men on Board;**

Ran Aground, on 24 Oct 1944, on Bombay Shoal, in Palawan Passage. Crew Rescued by USS DACE (SS 247), Later Scuttled by USS NAUTILUS (SS 168), and USS DACE (SS 247) :  
“NO LOSS OF LIFE “

**TANG (SS 306) - 78 Men on Board:**

Accidentally Sunk, on 24 Oct 1944, by Circular Run of It's own Torpedo, in Formosa Strait :  
“9 POW'S, SURVIVED “

## ***Commanders Corner***

### ***OCT 09***

Hello everyone! I hope everyone had a Great time at the Convention. I know it was a lot of hard work, time and effort and it paid off. We have been getting lots of Great comments about how well we pulled it off. I personally would like to Thank everyone involved with the planning and operations of the convention. My hats off to Mike & Tracy Hacking for all the long days and night they organized and tracked all the convention administrative data.

What I would like from everyone who was involved with the convention to email me or snail mail me any thoughts or lessons learned and any recommendations we can pass on to the next convention committee.

Our next big event is the Christmas Party we will co-host with the Scamp Base and SUBVETs WWII at the VFW Post. It looks like either Sat 19<sup>th</sup> Dec or the Sun 20<sup>th</sup> Dec at 1pm and serving dinner around 2pm. This to support the WWII folks and anyone else who has a hard time driving at night. Hopefully I can get a confirmation in the next few days and we will get the word out. There will be lots of great food, music and door prizes for everyone to enjoy and lets not forget the Great company of our shipmates, family and friends during the holiday season!!! And I think my buddy Santa is going to stop in on us.

Well, I can't forget about our Breakfast in November or Fred might get mad at me for not letting everyone know. Come on out and have a tasty breakfast at good prices and to see some friends there. Or just come on out and lend a hand serving, cooking, or making the coffee run. It would be great seeing you and your family there one way or another.

Don't forget about Veterans Day Parade on 11<sup>th</sup> November downtown San Diego. Must time is 9am at the North end of the county admin. Building on Harbor Drive. Parade will start at 11am. We will have the float and several other cars/trucks people can ride in. The Sub Base & CSS-11 folks will be there marching with us. We should have a big turn-out. Hope to see you all there. And it is the day after our meeting.

Well, all...that is all for now. As always, I hope we think about and prayer for our shipmates and their families to keep in good health and for their safety all the time.

Sincerely,

Bob Bissonnette  
Base Commander

### ***Minutes of the San Diego Base Submarine Veterans Meeting, October 13, 2009.***

1900 - Monthly meeting called to order by Base Commander, Bob Bissonnette.

Conducted opening exercises:

Reading of the Creed:

Pledge of Allegiance: Lead by David Ball.

Base Chaplin lead in opening Prayer and Tolling of the Boats for June.

USS S5 (SS 110) 1 Sept 1920

USS Grayling (SS 209) 9 Sept 1943

USS S-51 (SS 162) 25 Sept 1925

USS Cisco (SS 290) 28 Sept 1943

USS Seawolf (SS 197) 3 Oct 1944

USS S-44 (SS 155) 7 Oct 1943

USS Wahoo (SS 238) 11 Oct 1943

USS Dorado (SS 248) 12 Oct 1943

USS Escolar (SS 294) 17 Oct 1944

USS Shark II (SS 314) 24 Oct 1944

USS Darter (SS 227) 24 Oct 1944

USS Tang (SS 306) 25 Oct 1944

USS O-5 (SS 66) 29 Oct 1923

ALL HANDS OBSERVED A MOMENT OF SILENCE.

Secretary's report: Sailing lets shows 51 members and guests present.

Treasures report: Copy of report has been submitted to the membership.

All members of E-board are present with the exception of the Base Secretary.

VIPs introduced. Call for Committee Reports:

Chaplin's Report: CJ presented the Binnacle list to the membership.

Parade report: next parade is the Veterans Day Parade

Membership: Our organization has 339 members listed. Tonight we has signed up 2 new

Members: Donald Walbaum and Russ Filbeck.

Breakfast committee: Enjoy a good breakfast this 29 November, from 8 – 12am. Come on out

and support the base. Pass the word its open to everyone.

1925 break...Conducted 50/50 drawing

1938 Base Commander recalled to meeting order.

Unfinished business:

Christmas Party (joint with the WWII Vets at the VFW Post 3787 on either Dec 12<sup>th</sup> or Dec 19<sup>th</sup>. The VFW post can hold 100 people.

Dues – The base commander would like to have the base PAID by Dec 31, 2009 (at least 90%).

Nominations for all base officers.

Update on float: the brakes on the float has not been fixed.

New business: none

Good of the order: none

2010 meeting adjourned

**Sailing list:**

FRED FOMBLY	BILL EARL	RICK BITTNER
BOB BISSONNET	TE JIM BILKA	FRANK WALKER
CJ GLASSFORD	WILLIAM JOHNSTON	JACK KANE
CHARLIE MARIN	CHARLIE TATE	BOB FARRELL
ED WELCH	BOB OBERTING E	VERETT MAUGER
TOM POLEN	BILL JOHNSTON	DONALD WALBAUM
HARRY MCGILL	DAN EBERHARDT	DENNIS MORTENSEN
DAVID BALL	TOM WARNER	JACK ADDINGTON
PAUL HITCHCOCK	PHILL RICHESON	MATT BAUMANN
BUD ROLLISON M	MIKE HYMAN	RONGORENCE
JIM MALDON	JOE DUBOIS	DENNIS MCCREIGHT
GLENN GERBRAND	JOEL EIKAM	RAY FERBRACHE
JOE ACAY	NIHIL D SMITH	RUSS FILBECK
M. RESURREACTON	DON MATHIOWETZ	

*Membership Report for October 09*

New Member: None

Status: 347 members as of 10/18/09

Member Notes: I found the fine line between carelessness and stupidity: I thanked Mike and Linda Hacking for their superlative work on our convention, but the lovely lady’s name is Tracy, not Linda. My sincere apologies!

Speaking of Tracy Hacking’s departure, our SubVettes membership is down to about 3 active ladies. Their work has benefited the Base in many ways—you saw their work at the Convention—but we’re now expecting too much from too few. Please consider talking your wife (significant other) into joining the organization. They meet on the same days as our regular meeting (in the adjoining room), and plan ways in which to support us, often over a glass of wine. The Christmas Party is coming up, so have he contact their President, Debbie Bilka at 858-442-0231 or wilkabilka@aol.com.

Our Base needs masculine volunteer help too. Chaplain, MAA, Nominations Chairman, etc. Volunteer! You can’t have too many stars for your heavenly crown. Volunteer!

Dues for 2010 are payable BEFORE 1/1/2010. Info on your address labels may help: Above your name on the label of your Silent Sentinel is your dues status. The codes: B09 (B10, B11) means SD Base dues paid thru 2009 (2010, 2011); R09 means the same thing for National membership (R09, etc.). ‘A’ stands for Associate Member (i.e. A09). Life Members are all designated with an ‘L’ or ‘HC’ somewhere in the code (i.e. ‘L’ for national, ‘BL’ for Base Life, etc.). Your status for Base dues is first, and your National status is second on the top line.

Be safe,  
RonG

## Poll, Counter Poll

by Ron Gorence

A poll on USSVI asks if we should save money by having Conventions every other year.

No! I say.

Counter-Poll: Let's have Conventions two or three times a year!

Three hundred yen for a beer in Yoko or \$5(hk) in Hong Kong: Who cared then?

Inflation, Market Price, Geography? Some of us are old enough to have learned to live with it.

About 20 years ago I read in a Paris guidebook that a beer or a glass of wine would cost \$5 at the bar...but if you wanted it served at a table it would run about \$7. That's \$2 just to sit down, and at the time, I considered a \$2 beer outrageous here in the USA, so the news was shocking. But, it was also an unavoidable economic fact of life.

So, when I budgeted for a Paris trip with my wife (and some other couples with cut-rate fares from her company), I planned \$10 each (her and me) for breakfast/brunch, \$20 each for a nice supper, \$30 each for tours and souvenirs, \$40 each for beer and wine, and \$50 for the hotel; that amounted to \$250 per day for five days, or \$1,250 total. We took it in cash, travelers' checks, and French Francs, and never once complained about (or noticed) the topsy-turvy prices, because, in total, they weren't much more than staying at home (hotel costs and air fare excepted).

Interestingly, on the first night, a couple who had been our good friends caused a great commotion: Having offered to buy us a drink, the husband became belligerent when presented with the bill for four glasses of wine. I tried to calm him by saying that I was tired of walking all day, so I was willing to pay the extra \$2 just to sit down and drink. He hadn't read the guidebook, and he would have none of it.

He loudly accused the bartender, the waiter, and the establishment of "ripping-off" Americans. He could not hear me defending the waiter—who most certainly had nothing to do with prices—and he finally insisted that the police, gendarmes (or whatever) be called. My wife and I left, and we avoided this couple during all later Parisian adventures. He was a good guy, but could have written the book on ugly Americans. He and his wife absolutely hated the trip; my wife and I enjoyed it completely.

Like the lustrous City of Lights, enjoying a USSVI convention depends on attitude. Within my duties as Membership Chairman, I recently answered a member's angry protest that \$XX was too much to pay for 'rubber chicken' at the USSVI Convention Banquet. That's why he wasn't going.

I responded with something to the effect that whether it cost me \$10 or \$100 was immaterial. I don't attend the Main Banquet for a gourmet meal, and here's my logic:

I attend because there is a both incomparable and inexplicable pleasure in talking with a shipmate with whom I can share memories: like razzing our beloved Stew-Burner—whether he served gourmet delights or burnt steak.

Because we are capable of completely trusting each other, we are unconcerned over nearby threatening fires or earthquakes; we calmly sit and talk through it all. We are too busy mentally polishing our dolphins.

Both our grandchildren and our non-submariner eulogists may know the difference between a five-course brunch in France and a steak overcooked locally, but no matter how much they are willing to pay, neither has ever—or ever will—understand this experience. They will never even know what they missed.

I would.

Ron G

**Too big even for my vest!  
What to do?**

This banner from our Convention is now available . . . for sale? . . . for auction? . .

It would look great on your “I love me wall”, or on an office bulkhead somewhere at SubBase, or . . .

If you want to bid on this beautiful piece of art, or if you have an idea who might, please send Ron Gorence an email/ snailmail suggestion.



**Checking Account Balance @ 07/31/2009**

\$ 3,501.12

**INCOME for AUGUST 2009**

40/30/30 Base	42.00	
Holland Club Donation	40.00	
Midrats	33.00	
Silent Sentinel Donation	5.00	

Subtotal 120.00

**Membership** 430.00 430.00

Scholarship from 40/30/30	42.00	
Other Scholarship Income	10.00	

**Scholarship Income for August** 52.00

**Total Income for August (per Bank Stmt) \$ 602.00**

**EXPENSES for AUGUST 2009**

Membership	110.00	
Imaging Technologies - S.S. Printing	51.53	
Vest Refunds	122.00	
		283.53

**Total Expenses for August (per Bank Stmt) \$ 283.53**

**Checking Account Balance @ 08/28/2009 \$ 3,819.59**

**ASSETS**

Base Checking (08/28/09)		\$ 3,819.59
Scholarship Fund Included in Base Checking	2,562.00	
Base Savings (08/28/09)		9,327.73
Convention Account (08/31/09)		147,954.73

**TOTAL ASSETS \$ 161,102.05**

**Checking Account Balance @ 08/29/2009**

**\$ 3,819.59**

**INCOME for SEPTEMBER 2009**

40/30/30 Base  
 Holland Club Donation  
 Midrats  
 Silent Sentinel Donation  
 San Diego Base Patch Sales 30.00

Subtotal 30.00

**Membership 0.00**

Scholarship from 40/30/30  
 Other Scholarship Income

**Scholarship Income for September 0.00**

**Total Income for September (per Bank Stmt) \$ 30.00**

**EXPENSES for SEPTEMBER 2009**

Membership 145.00  
 Silent Sentinel Postage 51.26  
 Bonefish Base - Donation to Rockador Plaque 400.00

**Total Expenses for September (per Bank Stmt) \$ 596.26**

**Checking Account Balance @ 09/29/2009 \$ 3,253.33**

**ASSETS**

Base Checking (09/29/09) \$3,253.33  
 Scholarship Fund Included in Base Checking 2,562.00  
 Base Savings (09/29/09) 9,327.73  
 Convention Account (09/30/09) 19,887.38

**TOTALASSETS \$ 32,468.44**

**Lockheed Martin-Built Trident II D5 Missile Achieves Record 129 Successful Test Flights In A Row Over 20 Years**

*Pakistan Defence Forum, Oct. 21, 2009*

SUNNYVALE, Calif. – The U.S. Navy conducted successful test flights Sept. 3 and 4 of two Trident II D5 Fleet Ballistic Missiles (FBMs) built by Lockheed Martin (NYSE: LMT). The Navy launched the unarmed missiles from the submerged submarine USS West Virginia (SSBN 736) in the Atlantic Ocean.

The Trident II D5 missile now has achieved 129 consecutive successful test flights since 1989 – a record unmatched by any other large ballistic missile or space launch vehicle.

“These successful missile tests again demonstrate the readiness and reliability of the entire Trident II D5 Strategic Weapon System,” said Melanie A. Sloane, vice president of Fleet Ballistic Missile programs, Lockheed Martin Space Systems Company, the Navy’s Trident missile prime contractor. “The Navy’s Strategic Systems Programs achieves sustained performance through close government and industry partnerships. Lockheed Martin’s role includes not only missile design, development and production, but also a full range of operations and sustainment support services.”

The Navy launched the missiles as part of a Follow-on Commander’s Evaluation Test. The Navy conducts a continuing series of operational system evaluation tests to assure the safety, reliability, readiness and performance of the Trident II D5 Strategic Weapon System, as required by the Department of Defense’s National Command Authority. The Navy conducts the tests under the testing guidelines of the Joint Chiefs of Staff.

For the tests, the missiles were converted into test configurations using a test missile kit produced by Lockheed Martin that contains range safety devices and flight telemetry instrumentation.

First deployed in 1990, the D5 missile is currently aboard OHIO-class submarines and British VANGUARD-class submarines. The three-stage, solid-propellant, inertial-guided ballistic missile can travel a nominal range of 4,000 nautical miles and carries multiple independently targeted reentry vehicles.

Lockheed Martin Space Systems Company, Sunnyvale, Calif., is the prime contractor and program manager for the U.S. Navy's Trident missile. Lockheed Martin Space Systems employees, principally in California, Georgia, Florida, Washington, Utah and Virginia, support the design, development, production, test and operation of the Trident Strategic Weapon System. Lockheed Martin Space Systems has been the Navy's prime strategic missile contractor since the inception of the program more than 50 years ago.

The test also involved the Lockheed Martin-integrated navigation subsystem that provides navigation data required to support today's stringent Trident Weapon System performance requirements. Lockheed Martin Maritime Systems & Sensors Undersea Systems at Mitchel Field, N.Y., has been the prime contractor for the navigation subsystem aboard fleet ballistic missile submarines since 1955.

### **O'Kane Family Visits SUBASE**

*By ET3 Melissa Gavin, The Dolphin, Oct. 22, 2009*

GROTON, Conn. – It was a day of reminiscence and surprises as the family and friends of the late Rear Admiral Richard H. O'Kane, World War II submariner and Medal of Honor recipient, made their way around Naval Submarine Base New London (SUBASE) Oct. 9.

The tour was truly an emotional experience for the group. Although Rear Adm. O'Kane and his wife, Ernestine were very devoted to the Navy their entire lives, their son and daughter, James O'Kane and Marsha O'Kane Allen never really knew the extent to which their father was known throughout the fleet. What they learned of Rear Adm. O'Kane's great leadership they heard from veterans who had known or served with him, such as Bill Leibold who is currently the last surviving crew member from Tang.

"He really appreciated my father's leadership," said James O'Kane.

The tour of SUBASE, that James O'Kane described as "above and beyond," gave the family and friends the opportunity to see first-hand what the Admiral accomplished and how he is still remembered by Sailors today.

The family was grateful to the crew of USS New Hampshire (SSN 778). Rear Admiral O'Kane was a New Hampshire native having been born in Dover in 1911. Command Master Chief (SS) Glen Kline, New Hampshire Chief of the Boat, took time out of his day to give the O'Kanes a personal tour of his boat. This was not only the family's first time on a Virginia Class submarine, but their first time on a nuclear powered submarine.

"This was a chance for them to reconnect with the lifestyle and history of Admiral O'Kane," said Kline.

The family was especially surprised when Kline revealed the name of the ship's galley, O'Kane Café. When naming the galley, the crew found a native of the state of New Hampshire who would be a perfect fit.

"They didn't have to look very far when they found Admiral O'Kane. He is a hero within the submarine force and from New Hampshire, so what better example to use," said Kline.

The tour also included a visit to the Submarine Force Library Museum where the O'Kanes got to see, for the first time, the exhibit in the Medal of Honor gallery dedicated to their father. They also visited the museum archives where they actually got to hold some of the relics saved from Rear Adm. O'Kane's time in the Navy.

Following the tour, the group was joined by the leaders of SUBASE for lunch at Cross Hall Galley, where Captain Marc Denno presented James O'Kane and Marsha O'Kane Allen with old photographs of the family with the late Rear Adm. O'Kane.

The day concluded with the dedication of Building 429 as the new O'Kane Hall. James O'Kane spoke to attendees and showed his gratitude for the tour and the building dedication. "It's been our honor," he concluded.

### **Subs That Fear Going To Sea**

*Strategy Page, October 20, 2009*

October 21, 2009: China recently announced the decommissioning of "Submarine 303." This was a Type 33 boat (a copy of the Russian Romeo class). Romeo was the successor to the Russian Whiskey class boats, which were, in turn, based on the German Type XXI. The German design first showed up in 1943, and was the first modern submarine, in that it was designed to spend most of its time underwater (with just the snorkel device and periscope above water, to bring in air for the diesel engine and crew). The Type XXI was a 1,600 ton (on the surface) sub, compared to the 1,500 ton Romeos. Russia built over 500 Romeos, while China built over 80. Only about 7-8 of the Type 33s are still in service, used mainly for training. They rarely go to sea.

What was most interesting about this retirement was the official comment that the sub had steamed 38,000 kilometers at sea over its 20 year career. That comes out to less than a week at sea a year. This was not unusual. Chinese subs are not built well, and there have been many breakdowns and accidents at sea. The Chinese have preferred to keep their subs tied up at dock, and have the crew practice there. Not very good training, but it does reduce the risk of losing the boat at sea. And it is good for crew morale.

China has been trying to improve the quality of its subs, and warships in general. They stopped building Type 33s in the 1980s, and began producing 21 boats of an improved design (the Type 35), which they built until the end of the century. These were more reliable boats, and spent somewhat more time at sea than the Type 33s. During the last decade, the Chinese were still having problems with producing reliable diesel-electric boats, and even more problems with nuclear subs. But eventually, the Chinese will solve the quality problems, which is exactly what they planned to do all along.

### **Northrop Expands Bolt-Fastener Investigation, Pushes To Deliver New Mexico Sub By End Of Year**

*By Peter Frost, Daily Press, October 19, 2009*

Construction errors that could lead to problems operating weapons-handling systems on Virginia Class submarines extend beyond what was originally thought, a top Northrop Grumman Shipbuilding executive said last week.

Workers at Northrop's Newport News shipyard incorrectly installed bolts and fasteners that hold together tracks on which weapons are moved in the torpedo rooms of four submarines. Improper installation of these pieces could result in a misalignment of the equipment, preventing the movement of weapon cradles within the torpedo room.

Those problems now have been found throughout the forward portions of each of the subs, leading the company to expand its investigation to all areas where similar fasteners and bolts have been installed on Newport News-built vessels, said Matt Mulherin, the yard's general manager. The issue was not the equipment, rather "it had to do with the process of installing those types of fasteners," Mulherin said.

Northrop is conducting a wide-ranging analysis to identify where and in which vessels those fasteners have been installed. From there, the company will inspect and review potential problem areas and replace bolts and fasteners not installed to construction specifications.

"As we come to all the conclusions, we're having discussions with the Navy about what we found and how we can fix it," Mulherin said.

The Navy said it has not yet completed its review, and a spokesman said "it would be inappropriate" for the service to comment.

Although the probe has expanded, Mulherin said the most crucial areas where the errors have been found remain in the weapons-handling room.

The problems were found in August on the North Carolina, New Mexico, Missouri and California submarines. Of the four boats, none were underway. Only the North Carolina is commissioned, but it is in a maintenance period. The other subs are in various stages of construction in Newport News and in Groton, Conn.

Improperly installed bolts and fasteners could prevent the movement of weapon cradles within the torpedo room, an issue that could have essentially disabled the sub's ability to launch attacks or defend itself.

After the problems were found, Northrop and the Navy agreed to push back the delivery of the New Mexico until early 2010. The sub was scheduled to be commissioned in November.

Mulherin said last week that the company's goal is still to deliver the sub before the end of the year.

"We're making progress and fixing the things we've found, and we keep pushing" to expedite its completion.

The fastener issue was the third major construction gaffe for Northrop in the past two years. It prompted a yard-wide quality campaign that's scheduled to wrap up this week.

Northrop expects to have all fastener-related problems fixed by the second quarter of 2010, Mulherin said.

"We've certainly taken our lumps," Mulherin said. "But people agree that by the time our product gets out into the fleet, it's a 99.9 – and as far out as you can write – (percent) quality product."

### **U.S. Seeks To Keep Watching Russia's Weapons**

*By Thom Shanker and Peter Baker, New York Times, October 20, 2009*

WASHINGTON – With a key arms control treaty set to expire soon, the Obama administration is searching for ways to keep inspectors in Russia or else it risks losing American eyes on the world's second most formidable nuclear weapons arsenal for the first time in decades.

The administration has been negotiating a replacement for the pact, the Strategic Arms Reduction Treaty, or Start, which goes out of force on Dec. 5. But even if the talks produce a new agreement by then, the Senate and the Russian Parliament will not have time to ratify it before the old one expires – and some Republicans on Capitol Hill are warning that approval is far from certain.

In the absence of a treaty or an ad hoc but legally binding "bridge" authority, American inspectors would be forced to leave Russia when the treaty expired, and Russian inspectors would have to leave the United States. State Department lawyers are examining several options in hopes of preserving the ability to monitor and collect information about Russia's nuclear weapons, administration officials confirm.

Under Start, the United States is allowed a maximum of 30 inspectors in Russia to monitor compliance with the treaty. Russia likewise has interests in finding a bridge mechanism to continue its similar rights to inspections in the United States.

If negotiators for President Obama and President Dmitri A. Medvedev of Russia reach agreement on a follow-up treaty that the two leaders can sign by Dec. 5, then the administration may seek what is called "provisional application," putting the terms of the treaty into place on a temporary basis pending a Senate vote.

If the two sides do not settle on a new treaty, then the administration may seek some form of executive agreement with the Russians permitting inspectors to stay and information to be shared on terms similar to the current Start agreement while negotiators continue to talk.

Such an agreement, at least according to administration officials, would not require Senate approval, although lawmakers are demanding that the Senate Foreign Relations Committee be brought into the discussion. Administration officials said they would consult with Senate leaders on the plan.

Secretary of State Hillary Rodham Clinton raised the issue with her Russian counterpart, Foreign Minister Sergey V. Lavrov, during talks in Moscow last week, according to senior officials. But the two sides have not yet agreed to any specific measures to continue verification efforts in the absence of a new treaty, these officials said.

"We are working on options to provide transparency on strategic forces during the time before the new treaty enters into force," a senior administration official said Friday. "But I think it's premature to discuss specifics of any transparency options. Our focus is on getting the new treaty finished."

The impending lapse of the treaty is already raising significant concerns on Capitol Hill.

Senator Richard G. Lugar of Indiana, the ranking Republican on the Foreign Relations Committee, asked the State Department for a report on what legal instruments were being considered as a "bridge" between the expiration of Start and a new treaty, and for a description of what verification activities could take place without a treaty.

Andy Fisher, a senior adviser to the senator, said Mr. Lugar had also asked whether any of the proposed verification mechanisms would require Congressional authority. The senator has expressed specific concern that verification measures not be allowed to lapse, Mr. Fisher said.

The Start agreement was signed in 1991 before the collapse of the Soviet Union and went into effect in 1994, requiring both sides to reduce their arsenals to 6,000 warheads. The two sides are trying to produce a new treaty that keeps many of the verification and inspection elements of Start, while bringing the legal ceiling on strategic warheads and delivery vehicles down even below today's much lower levels.

The administration hopes to follow up with a new round of negotiations on another treaty with Russia that would enact more far-reaching reductions in nuclear weapons as part of Mr. Obama's goal of eventually ridding the world of all nuclear arms.

Mr. Obama and Mr. Medvedev struck a preliminary agreement on the terms of a new treaty during a meeting in Moscow in July that would cut the arsenals of both sides by at least a quarter. The two presidents agreed to cut each side's strategic nuclear warheads to between 1,500 and 1,675, down from the 2,200 called for in 2012 by the Treaty of Moscow, which was signed in 2002.

The number of delivery vehicles, like land-based intercontinental missiles, submarine-based missiles and long-range bombers, would be cut to between 500 and 1,100, down from the 1,600 currently allowed under Start.

Negotiations are progressing, but Russia continues to press for restrictions on missile defense systems to be included in the treaty, something the United States has refused to consider. Even though Mr. Obama reshaped President George W. Bush's plan for an antimissile shield based in Europe, Russian officials insist on legal limits.

Senior Republican aides in the Senate said a number of members were angered that the administration had undermined relations with two important NATO allies by canceling the Bush plan. It had called for 10 interceptors in Poland and radar in the Czech Republic; some senators have vowed to fight any post-Start treaty that includes provisions limiting missile defense.

Republicans also have called attention to comments by Russian military officers, who said that they might decide to field missiles with multiple warheads, which is seen as destabilizing and contrary to any new effort to lock in nuclear arms reductions.

Ratification of a follow-up treaty would require Mr. Obama and the Democratic leadership to hold all members of their party and gain at least seven more votes from Republicans.

Senators from both parties who specialize in arms control and military issues are asking that the president concentrate as well on how to enhance the safety of the nuclear stockpile and modernize the nation's weapons facilities in parallel with submitting a draft treaty for ratification.

Senators Jon Kyl and John McCain, both Republicans of Arizona, are leading that effort. A senior Republican Senate aide said some members were gearing up to push the administration to commit to developing a new warhead, although a number of senior Democrats argue that reopening a warhead assembly line would undermine the administration's nonproliferation message.

### **Lowering The Alert Levels In U.S. And Russia**

*By Walter Pincus, Washington Post, October 20, 2009*

The high alert levels for U.S. and Russian strategic nuclear forces are more political statements carried over from the Cold War than military necessities for the 21st century, according to a multinational study released last week.

The two nations "could examine how measures to reduce operational readiness can accompany the bilateral arms control process" as part of the current negotiations over renewal of the Strategic Arms Limitation Treaty, according to the study by the EastWest Institute, a nonprofit think tank. The study, "Reframing Nuclear De-Alert: Decreasing the Operational Readiness of U.S. and Russian Nuclear Arsenals," was supported by the governments of Switzerland and New Zealand governments.

The study reminds readers that the United States "keeps roughly 1,000 nuclear warheads on alert" atop 450 Minuteman III land-based intercontinental ballistic missiles (ICBMs) and on the submarine-launched ballistic missiles (SLBMs) aboard as many as four Trident subs patrolling in different parts of the world.

Russia "retains approximately 1,200 warheads on alert," according to the study, with most on ICBMs, although Moscow's few operational strategic subs could launch missiles from home ports and hit U.S. targets.

The study says political leadership in Washington and Moscow must take the lead on the issue, since the countries' military organizations that maintain the weapons cannot be expected to change institutionalized security objectives and operational principles on their own.

The Russians have been hesitant, according to the study, because "de-alerting appeared to be part of a set of well-coordinated measures to divest Russia of its nuclear deterrent." U.S. stress during the Bush administration on high-precision conventional weapons "only strengthened this view." The study concludes in part that de-alerting "is not possible without a regular dialogue on security issues and on strategic arms control."

The study does a good job of trying to move the debate away from the old fear of nuclear forces being on a "hair-trigger alert." It quotes Air Force Chief of Staff Gen. Norton A. Schwartz as saying, "There is rigorous discipline and process involved, and it is anything but hair trigger." The president must be briefed, make his decision to authorize a launch and have that transmitted to the National Military Command Center, which sends authorization codes to launch crews made up of two officers. The officers must confirm the authenticity of the message and together begin the launch sequence.

That system, according to the study, is "more like a revolver tucked away in its holster with its safety catch on than a gun cocked and ready to fire."

A Russian expert described his country's system as being in " 'zero launch' mode": It cannot be launched at even designated targets without approval from officials in Moscow, and when any order is given three officers must act together.

One enlightening section of the study points out how other nuclear-armed states handle operational status. China keeps an estimated 30 strategic systems on high alert, according to the study. It identified 12 as liquid-fueled ICBMs with two-megaton warheads "ready to launch in approximately 30 minutes," and 18 solid-fueled ICBMs "in silos on a 20-minute alert."

France has eliminated its land-based nuclear missiles, keeping the weapons on its submarines in the " 'lowest possible' level consistent with the maintenance of the credibility of its deterrent." England, which has eliminated its bomber- and land-based nuclear forces, keeps its Trident subs untargeted and "on several days' notice to fire."

India, which subscribes to a no-first-use doctrine, reportedly keeps its warheads separate from its delivery systems, as does Pakistan. When it comes to Israel, which does not acknowledge the reported 200 nuclear bombs and missiles in its arsenal, the study said, "not enough is known . . . to warrant an assessment."

The study lays out what it calls the "undesirable side effects" of some de-alerting proposals, primarily the removal of warheads from delivery systems. That approach, it said, would make de-alerted weapons "in storage . . . an attractive target for a first strike, including with conventional weapons." It also "may provoke a dangerous reconstitution race" at times of crisis.

Hans Kristensen of the Federation of American Scientists, who first mentioned the EastWest Institute study on his Secrecy News Web site, said de-alerting is among the issues being analyzed in the Pentagon's Nuclear Posture Review. When completed by the end of this year and approved by the White House, the review will set out the administration's strategic nuclear policies, including the appropriate alert levels.

## **Brazil A Nuclear Power? Probably Not**

By Andres Oppenheimer, Belleville News Deomcrat, October 19, 2009

Latin America has long prided itself on being the world's most populated nuclear weapons-free region, but recent statements by top Brazilian and Venezuelan officials are making many of us wonder for how long that will be the case.

Brazil's Vice President Jose Alencar made big headlines late last month when he stated Brazil should have the right to have nuclear weapons, which he said would give his country a greater "dissuasive" power and more "respectability" in world affairs. In 2007, Gen. Jose Benedito de Barros Moreira, Defense Ministry undersecretary for strategic affairs and international relations, made similar statements.

Under a 1967 regional agreement known as the Treaty of Tlatelolco, several Latin American countries agreed to abstain from developing nuclear weapons. Since then, 33 countries in the region have ratified the treaty, turning Latin America into the world's biggest nuclear weapons-free area.

Alencar cited the case of other emerging regional powers, such as Pakistan, which he said has won international relevance "precisely because it has a nuclear bomb." A spokesman for President Luiz Inacio Lula da Silva immediately clarified the vice president, much like the general before him, was speaking for himself and did not represent the government's views.

Last week, I interviewed Brazil Defense Minister Nelson Jobim, and asked him whether his country is planning to build nuclear weapons.

"No, it was a mistake on the part of the vice president," Jobim said. "There are two reasons why it's prohibited for Brazil to develop nuclear weapons: The Brazilian Constitution bans the use and production of nuclear weapons and international agreements signed by Brazil prohibit it as well."

He added Brazil will develop nuclear energy for peaceful purposes, which is allowed under international treaties. That will include construction of a nuclear-fueled submarine that will be faster than conventional submarines, but that will have no nuclear weapons, he said. Asked about Gen. Barros Moreira's 2007 statements, the defense minister said, "The general you are talking about was also speaking for himself."

I asked several academics which Brazilian officials we should believe.

Cristina Eguizabal, director of Florida International University's Latin American and Caribbean Center, said she believes the defense minister speaks for the government and for Brazil's political establishment.

"Brazil's foreign policy project is one of becoming a respected regional power, but not an anti-systemic pariah power," she said. "Developing nuclear weapons would put it alongside 'undesirable' states, such as Iran or North Korea."

Jose Azel, a senior research associate at the University of Miami, said Brazil's top foreign policy priority is to obtain a permanent seat on the United Nations Security Council. "Perhaps this talk about developing nuclear weapons is a way of creating some political buzz to obtain that position," he said.

Others believe Brazil is getting nervous because of the growing nuclear ties between Venezuela and Iran. Venezuelan President Hugo Chavez signed a nuclear cooperation deal with Iran in November 2008, and Venezuela's mining minister, Rodolfo Sanz, stated recently that Iran is helping explore Venezuela's uranium reserves.

While Chavez said such programs are "only for peaceful purposes," Colombian President Alvaro Uribe was skeptical of such claims.

"We are very worried, and I can't refrain from saying so, that nuclear war be brought to our neighborhood," Uribe was quoted as saying by the Agence France-Presse on Sept. 26. "This is very serious, very worrying."

My opinion: Brazil is on a roll these days and closer than ever to achieving its goal of becoming a regional superpower. Last week, it obtained a two-year temporary seat on the U.N. Security Council, shortly after getting the 2014 soccer World Cup and beating the United States to host the 2016 Summer Olympics.

In addition, Brazil's economy is scheduled to grow faster, and the country has recently found huge oil reserves, leading Lula to forecast Brazil will be the world's fifth largest economy in 10 years.

Most likely, Brazil will only develop a nuclear program for peaceful purposes because it will want to remain a good global citizen. But that will largely depend on what Venezuela does: If the Venezuela-Iran nuclear collaboration is not transparent – and creates as much international suspicion as Iran's semi-secret nuclear program – Brazil may change its mind, and Latin America could soon cease to be the world's most populous nuclear-free area.

## **Pacific Command Remains A Force, Keating Maintains**

The Honolulu Advertiser, October 18, 2009

The retiring commander of U.S. forces in Asia and the Pacific, Adm. Timothy Keating, disputes the contention that American power in this region is declining.

Keating, scheduled to relinquish command to Adm. Robert Willard tomorrow, said: "The notion that the U.S. military is in decline in the Pacific, I think, is not well-founded." The admiral said Pacific Command's readiness had not suffered even though 30,000 of the 300,000 soldiers, sailors, Marines and airmen assigned to the command are serving in Iraq, Afghanistan and the Indian Ocean.

In an interview in his office on a hill overlooking Pearl Harbor, Keating said: "I think it is an inaccurate characterization" to assert that Pacific Command's capabilities had declined, but acknowledged that his staff had "made some accommodations" in planning and training. "But writ large, we are as ready now as we were the day I walked in." That was 21 1/2 years ago.

About that time, Chinese, Russian, European, Middle Eastern and American scholars, military strategists and defense officials began speculating about a decline in American power. Under scrutiny, however, the issue is less the decay of American strength and more the economic and military rise of China, the emergence of other nations in Asia, and the revival of Russian power in Asia.

Keating said: "I don't worry about China but I think about them a fair amount. There's a difference." Staff officers estimate that the admiral and the staff spend about 30 percent of their time on issues dealing with China, including incidents such as Chinese interference with U.S. ships patrolling outside Chinese territorial waters. Pacific Command has 36 other countries in its area of responsibility.

The admiral, like his predecessors for the past 15 years, has cautioned the Chinese not to miscalculate U.S. capabilities and intentions. Staff officers recounted an episode in which a Chinese admiral suggested to Keating that China and the U.S. split the Pacific Ocean, China controlling the western portion and the U.S. the eastern waters. Keating firmly rejected the proposal.

In assessing Chinese power, many Western defense specialists focus on missiles, aircraft and warships but neglect intangibles such as training. Chinese fighter pilots, for instance, typically get seven or eight hours of flying time a month; their American counterparts get 20 to 22 hours a month in a physically demanding regime.

In Korea, the U.S. is assembling a large majority of its troops in a base complex south of Seoul where they will form an expeditionary force that can deploy elsewhere in Asia. South Koreans will take complete responsibility for their own defense against North Korea.

"This affords us the flexibility to use those forces," Keating said, "in ways that we had not been able to use them in times past."

The admiral noted that the U.S. last year replaced the aircraft carrier Kitty Hawk with the nuclear-powered and far more capable USS George Washington in the home port of Yokosuka, Japan. The role of Japan itself under its new leftist government headed by the Democratic Party of Japan is open to question. "We will be very interested in whatever security arrangement they choose," Keating said.

Guam, the U.S. territory in the central Pacific, is becoming a key forward operating base with three submarines posted there and Marines moving from Okinawa.

Keating lauded the contribution of Australia to the alliance with the U.S., Indonesian progress in countering terror, and the increasing interest India has in security dialogue and training with the U.S.

Summing up, Keating said: "I came in optimistic, I leave optimistic."

### **Dredging Permit Sought Near Submarine Base Pier**

*By Judy Benson, The Day, October 17, 2009*

Groton – The Navy is seeking permits to do dredging work at Pier 15 at the Groton sub base, dump the pier area soils in a specially dug trench nearby in the Thames River, and then dispose of the river bottom soils at three offshore sites. The dredging work is characterized by the Navy as a maintenance project to enable the return of a repair dry dock for Virginia-class submarines to the sub base.

The project would entail dredging about 237,000 cubic yards of riverbottom soils, according to Chris Zendan, base spokesman. Those soils would be transported by barge to approved disposal sites in Long Island Sound and Rhode Island Sound.

The Navy has applied to the U.S. Army Corps of Engineers for permits to do the dredging and dump the material at the sites. The closest, called the New London disposal site, is off Fishers Island. Another is located about 5 miles south of East Haven, and the third is located offshore from Narragansett Bay.

Zendan and Tim Dugan, spokesman for the Army Corps, explained Friday that the dredging would deepen the area near Pier 15 so that it would be suitable for the reinstallation of the dry dock. The dry dock, called Shippingport, had been at the base previously but is currently undergoing modifications at an out-of-state shipyard to enable it to handle Virginia-class submarines before it is returned to the base.

"The Navy looks forward to the permitting of the project, the maintenance dredging, and ultimately the Shippingport's certification to support the dry-docking of Virginia-class submarines," Zendan said in an e-mail.

Dugan the Army Corps will render a decision on the permits within a few months after Oct. 28, the deadline for comments from the public and government agencies. No public hearing is scheduled, he said, but will be if someone requests it.

### **EnerSys Awarded Contracts for Submarine Batteries in the US and Europe**

*NewsWireToday, October 16, 2009*

Reading, PA – EnerSys has been awarded contracts in the United States and Europe for submarine batteries with a value in excess of \$20 million (NYSE: ENS).

EnerSys, the world's largest manufacturer, marketer, and distributor of industrial batteries, announced that recently it has been awarded contracts in the United States and Europe for submarine batteries with a value in excess of \$20 million.

In the US, EnerSys has received a second consecutive contract award from the United States Navy to produce valve regulated lead acid (VRLA) batteries using its proprietary thin plate pure lead (TPPL) technology. This award represents 100% of the US Navy's requirement under their 2009 solicitation for VRLA submarine batteries. In February 2008, EnerSys was awarded its first production contract at the end of the successful culmination of a multi-million dollar multi-year cost sharing partnership between EnerSys and the US Navy.

"EnerSys has performed well on the first production contract and we believe provided a superior product," said John Craig, chairman, president and chief executive officer of EnerSys. "We are pleased that the US Navy has awarded us a second successive contract to supply all of their submarine battery needs."

EnerSys will continue to produce the submarine batteries at the Company's highly automated facility in Warrensburg, Missouri.

"The EnerSys team worked diligently throughout the ongoing initial production contract to maximize customer satisfaction and even met challenging delivery schedules as production started to ramp up. We have developed strong relationships with the US Navy teams at NSWC in Crane, Indiana, NAVSEA in Washington DC, submarine shipyards and other Navy sites" remarked Sanjay Deshpande, EnerSys vice president of Aerospace and Defense.

EnerSys has also recently received contracts in Europe for batteries for both nuclear and diesel electric submarines for existing and new customers. These batteries will be built in EnerSys' newly constructed specialty facility in Targovishte, Bulgaria.

### **Arrests at Trident Base in Bangor, WA**

*Washington Free Press, October 16, 2009*

Some 87 people participated in a vigil and nonviolent direct action against the Trident nuclear weapons system at the Main (Trident Avenue) gate to Bangor nuclear submarine base early on Monday August 10. Nine of the participants were voluntarily arrested.

Joy Goldstein, 74, of Vashon, WA, and her passenger, Swaneagle (Mary Tremblay), 59, of Vashon, WA, drove onto the base and were arrested by Naval security, processed and released.

Jessica Artiega, 24, of Tacoma, WA, Lynne Greenwald, 61, of Bremerton, WA, and Tom Shea, 80, of Snoqualmie, WA crossed the blue line onto the submarine base and attempted to block traffic entering the base while holding a large banner with a sunflower and broken Trident missile

saying, “Abolish Nuclear Weapons: Resist Trident”, and a peace flag. All three were arrested by Naval security, processed and released. Tom Shea offered the Naval security personnel copies of an article by Larry Kerschner, titled “August 9, 1945: Ruminations on Nagasaki.”

While vigilers held a variety of banners, flags and signs calling for peace and the abolition of nuclear weapons a second group broke the yellow “caution” tape designating the “free speech zone”, and strung it across the County roadway, blocking traffic entering the base. One member of this group walked among the vehicles waiting to enter the base, offering drivers sunflowers, a symbol of nuclear disarmament. Anne Hall, 64, of Seattle, WA, Jackie Hudson, 74, of Bremerton, WA, Brenda McMillan, 75, of Port Townsend, WA, Jean Sundborg, 69, of Seattle, WA, and Alice Zillah, 36, of Olympia, WA, were arrested by Washington State Patrol officers.

Next, Jessica Artieaga and Lynne Greenwald, who had already been arrested, processed and released by Naval authorities, re-entered the roadway on the county side, carrying the same banner as before. They were then arrested by the State Patrol. All those arrested by the State Patrol were taken to Kitsap County Justice Center in Port Orchard where they were booked and released. Veterans For Peace, Squadron 13, who brought their Peace Bus to Ground Zero Center in Poulsbo for the weekend, picked up the arrestees after their release and returned them to Ground Zero Center.

The Trident submarine base at Bangor, just 20 miles from Seattle, is home to the largest single stockpile of nuclear warheads in the US. In November 2006, the Natural Resources Defense Council declared that the 2,364 nuclear warheads at Bangor are approximately 24 percent of the entire US arsenal.

### **India Keeps Shooting Itself In The Foot**

*Pakistan Defence Forum, October 15, 2009*

Despite the provision by the Indian government of huge defence budgets, the country’s armed services have yet to achieve the desired modernisation, states Rahul Bedi

The long-delayed modernisation of the Indian military remains hindered by persistent bureaucratic vacillation on the part of the services and the Ministry of Defence (MoD).

Internecine service rivalries, ambiguous, complex and constantly changing procurement policies as well as recurring corruption scandals also contribute to blocking the renovation of the country’s defence materiel.

With defence purchases projected to double to more than USD30 billion by 2012 and to climb further to around USD80 billion by 2022 as India continues to import its requirements, officials have admitted that the operational competence of its nearly 1.4 million-strong armed forces would remain “compromised” by equipment deficiencies and long-stalled modernisation programmes.

“Even though our government is earmarking huge budgets, it is not being fully reflected in our modernisation efforts,” Defence Minister A K Antony declared in New Delhi earlier this year. Allocation of money has never been a problem. The issue has rather been the timely and judicious utilisation of money allocated, he conceded.

The inability of the services and MoD to take timely decisions led to INR42.17 billion (USD878 million) earmarked for purchases, upgrades and modernisation in Fiscal Year 2007-08 (FY07-08) being returned unspent to the federal fund. Earlier, INR183 billion had similarly reverted unused from FY02-07 as tenders were issued, withdrawn and then re-issued, contributing to overall delays that resulted in operational shortcomings.

“Under such conditions increased budgetary support each year makes little or no difference to military capacity building,” said former Lieutenant General V K Kapoor. The entire procedure for gainfully expending the capital account needed overhauling to be effective, he declared, adding that the gap between the desired and existing military capability was rapidly widening.

Military planners said all these adverse factors were also impinging negatively on the military’s overall aim of becoming network-enabled by 2009 and network-centric a year later.

Meanwhile, trials for the import of 197 light utility helicopters (LUHs) for the Army Aviation Corps (AAC) and Indian Air Force (IAF) to replace obsolete HAL-manufactured HSA 316B Chetak and HSA 315B Cheetah helicopters, which were due to take place in mid-2009, were rescheduled, replaced by winter try-outs expected to begin in February 2010. Summer trials will then follow.

These trials follow the MoD’s scrapping in November 2007 of the USD500 million-USD600 million off-the-shelf acquisition of Eurocopter AS 550 C3 Fennec light observation helicopters in support of this requirement on the grounds of unexplained “discrepancies” in the evaluation process.

AAC sources concede that, even in the best-case scenario, it would take at least three years before the LUH trial reports were finalised, price negotiations concluded and the deal inked. Thereafter it would be another three to four years before the first batch of LUHs began arriving, leaving a massive operational shortfall.

Procurement by the Indian Army of around 3,600 varied 155 mm lightweight, towed, wheeled and tracked howitzers for around 180 of its 220 artillery regiments – as part of a long-pending modernisation drive under the Field Artillery Rationalisation Programme – also stands deferred by at least a decade. Under this programme the artillery, which currently operates six different calibres, aims by 2020-25 to acquire a mix of 155 mm/39 cal lightweight and 155 mm/52 cal guns for an estimated USD5 billion-USD7 billion.

Additionally, the procurement, development and upgrade programmes for the army’s main battle tanks – such as the T-90S, the domestically designed Arjun and the T-72M1 – are also in a state of flux, plagued by technological shortcomings and postponed decisions. For example, the majority of around 1,800 T-72M1s still await night sights after years of tendering and trials, with the latest round recently ending inconclusively.

In addition, the bulk of the army’s air-defence guns – Bofors L-70s and Soviet Zu-23-2s and Zu-23-4s – and missiles such as the Russian Osa-AK and Kvadrat date back 30 to 40 years and need replacing.

The ambitious Future Infantry Soldier as a System (F-INSAS) programme to upgrade 465 infantry and ‘dedicated’ paramilitary battalions by 2020 is also deferred. F-INSAS includes a fully networked, all-terrain, all-weather personal equipment platform as well as enhanced firepower and mobility for the digitised battlefield of the future.

The IAF, for its part, is preoccupied with restoring its depleted assets, which will shortly decrease from approximately 30 combat squadrons to around 26 after the retirement of large numbers of Soviet and Russian MiG-21, MiG-23 and MiG-27 fighter aircraft.

The IAF has repeatedly warned the federal government to implement “corrective measures” to acquire additional fighters or risk losing air superiority over its neighbouring nuclear rival, Pakistan - but to little avail.

Trials to acquire 126 Multirole Combat Aircraft are continuing, but analysts do not expect a contract to be finalised and awarded before 2013-14, with inductions predicted to begin some time during the following four years and to continue until 2020-21.

The contract for the upgrade of the IAF's 51 Mirage 2000H aircraft is yet to be inked despite years of negotiation following price differences, while the agreement to retrofit 63 MiG-29B/S aircraft, including seven MiG-29UB trainers, has been delayed. The IAF's transport squadrons, air and ground missile capability as well as its helicopter fleet also need urgent augmentation.

Antony recently admitted that the IAF's air-defence ground environment systems, dating back to 1970-71, were "inadequate" for effective surveillance despite major changes in the security scenario and in technology, and the growing magnitude of sophisticated aerial threats.

The Indian Navy's six Scorpene submarines, under construction at Mazagon Dockyard in western India since 2006, face a cost escalation of INR20 billion over the original INR187.98 billion contract signed in October 2005, official sources said. Consequently their delivery dates of between 2012 and 2017 have been postponed as talks continue over the price hike.

The dispute over the threefold price increase - from USD974 million to nearly USD3 billion - for the retrofit of the 44,700-ton former Russian aircraft carrier INS Vikramaditya (ex-Admiral Gorshkov), whose arrival has been delayed by four years to 2012-2013, also awaits resolution.

The navy also faces a grave shortage of combat aircraft to operate from its sole existing, and recently retrofitted, aircraft carrier INS Viraat, while its anti-submarine warfare helicopters are well past retirement age. Additionally, 63 per cent of its already deficient submarine fleet will be due for retirement by 2012.

### **Rolls Royce Heads North To Trial Rescue Submarine At The Underwater Centre**

*Ron's ROV Links, October 14, 2009*

One of the world's most advanced rescue submersibles has undergone a series of training exercises and simulated rescues at The Underwater Centre in Fort William. The NATO Submarine Rescue System (NSRS), which has been designed and built by a consortium lead by Rolls Royce, was tested at The Underwater Centre as part of a seven day training schedule.

A free swimming rescue vehicle which can be deployed world wide to reach stricken submarines, the submersible has a crew of three and can rescue 12 people at a time.

Capable of diving up to 610 metres and coping with pressures of five bars, it also boasts an innovative communication system which comprises a 7mm fibre optic cable which connects the main rescue vehicle to the surface.

The Underwater Centre, based on the shores of Loch Linnhe, allowed the submarine to be tested at depths of up to 150 metres – deeper than most parts of the North Sea. As well as providing trials facilities, it is a world class centre of excellence for commercial diving and Remotely Operated Vehicle (ROV) training.

Simulating real life rescues, a 'target' acting as a representation of a sunken submersible was positioned underwater at 50 metres. The NSRS was then launched in a bid to test the 'mating process' – ensuring that the soft seal of the rescue vehicle properly sticks to the hatch of a stricken submarine.

The NSRS was previously tested at The Underwater Centre as part of acceptance and proving trials. Last year, the facility also hosted trials for the LR7 rescue submarine, commissioned by the Chinese Navy, underlining the Centre's first class industry relevant testing conditions.

Designed and built to replace the ageing LR5 in 2006, the NSRS is a joint British, Norwegian and French project.

In the event of a submarine in distress, it will be deployed to the nearest suitable port and taken on board a mother ship. At the scene of the stricken submarine, the mother ship, using a portable A-Frame, will launch the vehicle which will then 'mate' with the escape hatches of the submarine.

Located at the foot of Ben Nevis, The Underwater Centre's sheltered position means testing can be carried out 12 months of the year even in the most extreme weather conditions.

Steve Ham, general manager of The Underwater Centre said:

"This is the second time Rolls Royce has chosen to trial new technologies here at The Centre. We have the full package for trials and testing – as well as the unique, natural facilities of our Loch Linnhe site, we have a fully equipped pier complex which provides an excellent range of facilities.

"These latest trials are testament to our reputation for offering industry relevant conditions for trialling some of the world's most revolutionary technologies – including the NSRS.

"The rescue trials focused on the mating process, which is the most complex and difficult part of a submarine rescue and our highly experienced instructors and divers provided valuable support to the NSRS team throughout."

"We are delighted to have attracted the trials of the NSRS as it is a highly prestigious and exciting project."

### **Russia Reserves Right To Conduct Preemptive Nuclear Strike**

Say US, NATO pose threat of aggression

*By David Nowak, Boston Globe, October 15, 2009*

MOSCOW – A top Russian security official says Moscow reserves the right to conduct preemptive nuclear strikes to safeguard the country against aggression on both a large and a local scale, according to a newspaper interview published yesterday.

Presidential Security Council chief Nikolai Patrushev also singled out the United States and NATO, saying Moscow's Cold War foes still pose potential threats to Russia despite what he called a global trend toward local conflicts.

The interview appeared in the daily Izvestia during a visit by Secretary of State Hillary Rodham Clinton, as US and Russian negotiators try to hammer out a nuclear arms reduction treaty by December. It also came amid grumbling in Moscow over US moves to modify plans for a missile shield near Russia's borders rather than ditch the idea outright.

Patrushev said a sweeping document on military policy including a passage on preventative nuclear force will be handed to President Dmitry Medvedev by the end of the year, according to Izvestia.

Officials are examining "a variety of possibilities for using nuclear force, depending on the situation and the intentions of the possible opponent," Patrushev was quoted as saying. "In situations critical to national security, options including a preventative nuclear strike on the aggressor are not excluded."

The proposed doctrine would allow for the use of nuclear weapons "to repel an aggression with the use of conventional weapons not only in a large-scale but also in a regional and even local war," Patrushev was quoted as saying. He said a government analysis of the threat of conflict in the world showed "a shift from large-scale conflicts to local wars and armed conflicts."

"However, earlier military dangers and threats for our country have not lost significance," he was quoted as saying. "Activity on receiving new members into NATO is not ceasing. The military activity of the bloc is being stepped up. US strategic forces are conducting intensive training on using strategic nuclear weapons."

Russian military analysts said the hawkish former domestic intelligence chief's remarks were mostly muscle-flexing for show, because what he revealed about the proposed new doctrine suggests it differs little from the current one.

One independent analyst, Alexander Golts, said current policy already allows for a nuclear strike to repel an aggression of any sort.

Another, Pavel Felgenhauer, said that effectively allows for a preemptive strike because the type of aggression that would warrant such a strike is not clearly defined.

Russia's NATO envoy, Dmitry Rogozin, argued the proposed doctrine does not contradict arms reduction efforts.

Still, Patrushev's focus on local conflicts could rattle Georgia, the small neighbor that Russia routed in a five-day conventional war with Russia last year.

### **Guatemalan Authorities Capture Submarine Carrying Cocaine**

*FOX News, Oct. 22, 2009*

GUATEMALA CITY – Authorities in Guatemala say they have captured a mini submarine carrying an undetermined amount of cocaine off the country's Pacific coast.

The vessel and its crew have been taken to the Guatemalan port of San Jose.

Defense Ministry spokesman Col. Byron Gutierrez said Thursday the vessel was detected by Guatemalan personnel operating jointly with the U.S. Drug Enforcement Administration.

Several men were captured inside the sub Wednesday about 200 miles off the coast, but Gutierrez offered no further details. Traffickers use such subs to move multi-ton loads of cocaine to Mexico and Central America. The vessels are believed to carry nearly a third of U.S.-bound cocaine northward through the Pacific.

### **Iran Bought Submarines From N. Korea, Helped Syria Get WMDs: Report**

*By Hwang Doo-hyong, Yonhap News, Oct. 22, 2009*

WASHINGTON – Iran has purchased several midget submarines from North Korea and has helped Syria get missiles and other forms of weapons of mass destruction from the North, a report has said.

"Iran purportedly has acted as an intermediary with North Korea to supply Syria with various forms of WMD and missile technology," said a Congressional Research Service report, "Iran: U.S. Concerns and Policy Responses."

The report, issued Oct. 5, described the Obama administration's recent engagement with Syria as "means to wean Syria away from its alliance with Iran."

However, the report predicted that such an effort will not likely succeed, saying, "Iran is a major investor in the Syrian economy, which attracts very little Western investment, and some believe the Iran-Syria alliance is not easily severed."

U.S. Secretary of State Hillary Clinton Wednesday singled out North Korea and Iran as nonproliferation policy failures, describing "the range and intensity of current nuclear proliferation challenges" as "alarming."

"The international community failed to prevent North Korea from developing nuclear weapons. We are now engaged in diplomatic efforts to roll back this development," she said. "Iran continues to ignore resolutions from the United Nations Security Council demanding that it suspend its enrichment activities and live up to those international obligations. Thwarting the nuclear ambitions of North Korea and Iran is critical to shoring up the nonproliferation regime."

The CRS report also said that Iran "is said to possess several midget submarines, possibly purchased assembled or in kit form from North Korea."

It noted, "Iran claimed on Nov. 29, 2007, to have produced a new small sub equipped with sonar-evading technology."

Iran is believed to be one of the biggest buyers of North Korean arms, with annual purchases of up to US\$2 billion.

Iranian officials were said to be on the scene when North Korea launched a long-range rocket and detonated its second nuclear device in April and May, respectively.

Iran is also under U.N. sanctions for its nuclear programs, which the U.S. and its allies see as an effort to build nuclear weapons, although the Tehran government insists it is for producing electricity.

Obama has issued an ultimatum to Iran to suspend enriching uranium for possible weapons production by the end of the year, warning of harsher sanctions.

Obama said in a speech to the U.N. last month he was "committed to diplomacy" in resolving the North Korean and Iranian nuclear issues.

"But if the governments of Iran and North Korea choose to ignore international standards – if they put the pursuit of nuclear weapons ahead of regional stability and the security and opportunity of their own people, if they are oblivious to the dangers of escalating nuclear arms races in both East Asia and the Middle East – then they must be held accountable," he said.

### **Academy Falls Short Of Sub Volunteers**

*By Philip Ewing, Navy Times, Oct. 25, 2009*

Too few Naval Academy seniors opted to become nuclear-qualified submarine officers this fall, so the school's administration has asked more students to make that their career path and, if necessary, will force them.

In a message to the Brigade of Midshipmen on Tuesday, the academy's director of professional development, Capt. Stephen Evans, wrote that the academy this year was required to send 125 officers into the nuclear submarine training pipeline, but that only 92 had been accepted by Naval Reactors. That meant 33 midshipmen would be asked to volunteer or told to become sub nukes.

"If you are subsequently identified for a submarine interview, understand that you were released from your preferred community after serious consideration," Evans wrote. "Be professional and focus on the positive aspects of serving your country in the submarine force."

Naval Academy spokesman Cmdr. Joe Carpenter said it wasn't uncommon for academy officials to move midshipmen from preferred warfare areas to areas where they were needed, although he said there weren't records showing when or for which disciplines. The academy's mission to provide the officers the Navy requires means the school must sometimes supercede midshipmen's wishes, he said.

Evans wrote to the midshipmen: "Although your personal desires are strongly and tirelessly considered, community assignments are ultimately grounded in Navy and Marine Corps requirements."

In last year's graduating class, 78 percent of midshipmen entered the warfare area they selected as their first choice, and 92 percent got their first or second choice, Carpenter said. The first midshipmen this year who will be urged to choose submarines are those who picked it as their second choice, he said. They are required to serve at least five years after commissioning.

Although the Navy's top leaders have said they want women to serve on subs, female midshipmen aren't yet permitted to choose the submarine career path.

Demand for nuclear-qualified submarine junior officers has grown over the past few years as more young officers leave the fleet to pursue civilian careers, Chief of Naval Personnel Vice Adm. Mark Ferguson told Congress in March.

Although he did not provide statistics, Ferguson said the Navy needed plenty of junior officers to grow into control-grade officers.

Naval Reactors' total yearly requirement from all three sources of officers – the academy, Naval Reserve Officer Training Corps and Officer Candidate School – was unavailable by Friday.

### **First World War Sub Wreck Found**

*The Press Association (United Kingdom), Oct. 24, 2009*

Researchers moved a step closer to finding out why a British submarine sank in the First World War with the discovery of a wreck.

The submarine, which had 33 crew on board, never returned from a routine patrol in the Baltic Sea in May 1916 during an operation authorised by Winston Churchill.

Swedish marine survey company Marin Matteknik (MMT) said the HMS E18 was found last week near the Estonian island of Hiiumaa, some 90 miles (140km) west of Tallinn, after a 10-year search.

Work can now get under way to document the wreck and investigate what happened. Submarine expert David Hill, who has seen images of the wreck taken by a remotely operated vehicle, said: "Without a shadow of a doubt they do show an E class submarine and certain details indicate that it is probably E18."

Swedish historian-explorer Carl Douglas said the discovery was "the fruition of nearly a decade of work".

"This is a very emotional discovery for me and the search team," he said. "We will now complete our mission to document this wreck and inform the relevant authorities. We want to investigate the exact cause of the sinking – and to honour the fallen by telling their story."

MMT said the MV Triad searched the area off Hiiumaa last week using state-of-the-art side scan technology.

A spokesman for the firm said the submarine was found in an area known to have been mined by Germany during the First World War. Ola Oskarsson, of MMT, said: "Apart from the damage on port side and tinier damages elsewhere, the wreck is in surprisingly good shape."

A total of 33 men were lost, including three Russians who were serving on the E18 in a liaison capacity.

In a statement released by MMT, naval historian Eric Grove said the Baltic campaign was the Royal Navy's most successful submarine campaign of the war. He said it caused the Germans to completely rethink their use of the Baltic and forced them to be the first side in the war to introduce the convoy system to ensure vital iron ore supplies from Sweden made it through the Baltic to Germany.

### **Israel Interested In Two German War Ships**

*Deutsche Well, Oct. 23, 2009*

Media reports suggest that Israel is considering the purchase of two sophisticated German warships. However, it is unclear who will foot the bill for the multi-million-euro deal.

Israel would like the two warships, worth an estimated 400-500 million euros (\$600-750 million), free of charge, the German daily Hannoversche Allgemeine Zeitung said on Friday, citing government sources.

The ships might be supplied by Hamburg's Blohm + Voss shipyard who confirmed an Israeli enquiry to German media without divulging any further details on the potential deal. The ships' weapons would be supplied by the United States.

The two state of the art corvettes, which are hard to detect by radar, are said to be larger than Israel's current flagship Hanit.

The Israeli navy wants to install a "Barak 8" missile defence system on the two vessels along with sophisticated radar so as "to be prepared for potential wars", according to the Israeli daily newspaper Ma'ariv.

The move would allow Israel to shift a part of its missile defense system to the sea, rendering it less vulnerable to potential rocket attacks.

Germany has previously helped equip the Israeli navy, delivering three submarines in the years 1999-2000.

Two further submarines are currently under construction in Kiel, costing at least 500 million euros apiece. Germany is to foot a third of that bill.

### **New-Type Submarine Patrols In Deep Sea**

*By Qian Xiaohu and Fang Lihua, PLA Daily, Oct. 23, 2009*

The new-type home-made submarine

No.330 submarine of a submarine flotilla of the East China Sea Fleet (ECSF) of the PLA Navy frequented the vast territorial seas in recent years. It has successfully accomplished dozens of major tasks such as equipment acceptance, test and long voyage and is dubbed as a "pioneer" of the new-type submarine of the PLA Navy.

No.330 submarine is a new generation submarine independently developed and produced by China. And it has such advantages as low noise, long underwater sailing time and advanced power as well as weapon and equipment system.

The reporters experienced a maritime exercise in a sea area not long ago. New-type submarine combat group with No.330 submarine as the leader concealed, broke through the blockade of the destroyer formation and anti-submarine military strength in the air and entered the attack position by adopting new combat method. "Direction and speed of the target are ascertained, a type of torpedo in 3# pipe gets ready to release!" As soon as the order of the captain was released, the torpedo left the pipe. Several minutes later, the torpedo hit the target accurately. This exercise symbolized that a new generation submarine of the PLA Navy has generated battle effectiveness.

### **First Acoustic Hyperlens Boosts Power of Ultrasound and Sonar**

*By Jeremy Hsu, Popular Science, Oct. 26, 2009*

Imaging an unborn fetus and spotting a lurking submarine could both become much easier with the world's first acoustic hyperlens. The device manipulates imaging sound waves to provide an eightfold increase in the magnification power of technologies such as ultrasound and sonar.

Hyperlenses use specially engineered materials that combine metals and dielectrics, and allow scientists to image features much smaller than typical light wavelengths.

Researchers at the U.S. Department of Energy's Lawrence Berkeley National Laboratory applied this approach to capture information in evanescent sound waves, which have higher resolution and more detail but dissipate much more quickly than typical

waves.

The acoustic hyperlens consists of 36 brass fins arrayed in a pattern resembling a hand-held fan. The fins remain embedded in a brass plate from which they were shaped, and extend from an inner radius of just 2.7 centimeters to an outer radius of 21.8 centimeters.

“As a result of the large ratio between the inner and outer radii, our acoustic hyperlens compresses a significant portion of evanescent waves into the band of propagating waves so that the image obtained is magnified by a factor of eight,” said Lee Fok, one of the researchers in the Berkeley Lab.

The same lab group, led by materials scientist Xiang Zhang, demonstrated a similar feat in 2007 by breaking the “diffraction limit” that usually prevents researchers from imaging features smaller than typical light waves.

Zhang’s group is now upgrading their approach to produce 3-D images, and wants to make the technique compatible with the pulse-echo technology found in medical ultrasounds and underwater sonar.

### **New Russian Carrier Killers**

*Strategy Page, Oct. 27, 2009*

In Russia, the fifty man crew for the first Yasen (Graney) class SSGN (nuclear powered cruise missile sub) arrived at the Sevmash shipyards where their boat is being built. The crew was put together four years ago, and has been training ever since. The crew will continue training, increasingly on the first boat of the class (the Severodvinsk), which will be launched in a few months and enter service within two years.

Last July, construction began on a second Yasen class SSGN. Russia plans to complete six boats of this class within the next six years. Construction of the first Yasen class boat, the Severodvinsk, began in 1993, but lack of money led to numerous delays. Originally, the Severodvinsk was to enter service in 1998. Work on the Severodvinsk was resumed six years ago. If work is not interrupted, the second Yasen class boat should be ready in less than six years.

The 9,500 ton Yasens carry 24 cruise missiles, as well as eight 25.6 inch torpedo tubes. Some of the cruise missiles can have a range of over 3,000 kilometers, while others are designed as “carrier killers.” The larger torpedo tubes also make it possible to launch missiles from them, as well as larger and more powerful torpedoes. The ship is highly automated, which is why there is a crew less than half the 134 needed to run the new U.S. Virginia class boats. The Yasen design is based on the earlier Akula and Alfa class SSNs. Russia had originally planned to build 30 Yasens.

### **Former Crew Wants Sub Kept Out Of Water**

*By Schuyler Kropf, Charleston Post and Courier, Oct. 28, 2009*

The sailors who crewed the 325-foot-long submarine Clamagore think it’s time to pull the boat out of the water at Patriots Point and put it on display on dry land.

If not, they fear their Cold War memorial to the “Silent Service” will get lost to the elements, maybe forever.

“I think it will be a national disgrace if they let that boat perish, or let it perish any more than it has,” said Jim Frostman, who was stationed aboard the Clamagore from 1955-1958.

“It can’t survive down there,” said Don Ulmer of Seattle, who went from sailor to U.S. Naval Academy graduate and the Clamagore’s captain in the late 1960s.

The pair are in town for the annual reunion of the Clamagore Veterans Association. In between telling Cold War stories at their hotel Tuesday, several of the ex-crew members said it’s time for the submarine to leave the water, contending that it could survive almost indefinitely clear of Charleston Harbor’s damaging salts.

With the Patriots Point Naval & Maritime Museum’s two other major vessels – the destroyer Laffey and aircraft carrier Yorktown – also under stress, the crew of the Clamagore said their boat is being overshadowed by the two larger ships, something they consider an injustice given the submarine’s role in defending the United States.

The Clamagore’s story might be one that’s been under-told in history. Commissioned in March 1945, much of her work was done under the cloak of the 1950s and ’60s Cold War, when American and Soviet subs globally played games of Blind Man’s Bluff beneath the sea.

Some of her crew let on that the Clamagore’s hush-hush missions included trips to the shallows off Cuba during the missile crisis, where they spied on heavily used communist roads.

There also were cold-water runs to the frigid north shores of Russia, and war games where the Clamagore acted as a prowling enemy submarine.

Several of the men also said they’ve signed government documents in which they swore to secrecy on specific details of their work. But all have stories of life in the submarine’s cramped quarters, where the stink of diesel fuel stuck to everything and every member of the 80-man crew.

“You can still smell it on the boat today,” Frostman said.

Historically, of the nine U.S. submarines that was classified as a Guppy III, eight have been scrapped; only the Clamagore survives.

The Clamagore’s status is far from secure. A recent report by the Navy said conditions don’t appear good.

“The outer hull has holes and sections where hull plate has been eaten away by corrosion,” it read.

“Below the waterline the hull is covered by thick marine growth and therefore cannot fully be assessed as to its condition.

However, the severe pitting at the waterline is a good indicator that the plate beneath the waterline is in poor condition as well.”

Dick Trammel, executive director at the Patriots Point Development Authority, said officials are looking at solutions to protect the sub, ranging from raising it and moving it to land to putting it dry dock for repairs.

A study has been commissioned to look at a variety of costs, including what it would mean to take out piers and the loss of revenue if the sub leaves or is closed off for a while.

Meanwhile, the Clamagore’s crew members said they just want their ship considered on equally footing when it comes to keeping the vessel ship-shape and on display.

“I know the carrier is a big thing,” Ulmer said. “But (the Clamagore) is a unique experience.”

### **Iran buys North Korean WMD for Syria, midget submarines for both** *DEBKAFfile, Oct. 27, 2009*

The US Congressional Research Service reveals that Iran has helped Syria obtain “various forms of weapons of mass destruction” and missiles, as well as buying midget submarines – all from North Korea.

DEBKAFfile’s military sources report that the North Korean miniature subs are capable of dropping small teams of commando forces on enemy shores, damaging large warships and mining the approaches of naval bases and harbors. They are capable of sowing EM-52 “rising mines” originally developed by China, which lurk on deep sea beds until triggered by a passing ship to release a missile which shoots up to strike its hull.

This weapon substantially enhances the Syrian and Iranian navies’ menace, a development Israel will have take into account in the defenses of its Mediterranean naval bases and commercial ports.

The US CRS notes” Iran purportedly has acted as an intermediary with North Korea to supply Syria with missiles and various forms of WNMD, without specifying whether they are nuclear, chemical or biological.

To keep one of its few allies close, Tehran uses Syria as a “transit point for Iranian weapons shipments to Hizballah and both countries see Hizballah as leverage against Israel to achieve their regional and territorial aims.”

The report sees the Obama administration’s engagement with Syria as a bid to draw Damascus to loosen its bonds with Tehran, but sees little chance of this effort succeeding.

On Oct. 20, DEBKAFfile’s military sources disclosed that Syria, Iran’s second ally with an Israeli border, has decided to transfer one-third of its missile stockpile to the Hizballah in Lebanon, topping up its arsenal with 250 medium-range surface rockets that can cover central as well as northern Israel, which was heavily blitzed in the 2006 war.

### **Admiral: Complacency Caused Sub Collision**

*By Andrew Scutro, Navy Times, October 28, 2009*

MCLEAN, Va. – Complacency and poor management of surface contacts led to the March 20 collision between the attack submarine Hartford and the amphibious transport dock New Orleans in the Strait of Hormuz, according to the Navy’s leader of the undersea fleet.

Speaking Wednesday at the annual Naval Submarine League meeting, Submarine Force commander Vice Adm. Jay Donnelly described a control room with “a lot of informality” and a “series of personnel failures” he blamed on the sub’s leadership.

The collision, which happened at night, came as the sub was making a submerged transit to Jebel Ali, its last port call before heading home to Groton, Conn.

The crew had just finished an intense operational phase of its deployment and “everybody let down their guard” for what was actually one of the most challenging phases, crossing the strait at periscope depth, he said.

“There was a great deal of complacency involved in the crew,” he said. “They had been at sea for 63 days operating in areas with high contact density.”

After the collision, both ships limped into Bahrain, New Orleans with a giant gash in the hull and Hartford with a sail partially torn from its hull, among other damage. No one was seriously injured in either crew.

Hartford’s damage was complicated and the ship is still in the yard. New Orleans rejoined the fleet from Bahrain.

The commanding officer of Hartford, Cmdr. Ryan Brookhart, and chief of the boat Master Chief Electronics Technician (SS) Stefan Prevot were both fired after the incident.

Speaking in response to a question after his prepared remarks, Donnelly said he had just spent a day on Capitol Hill last week explaining the incident to House and Senate armed services committees.

He also noted that more or better technology would not have helped the situation, as the sub knew the New Orleans and another ship were nearby.

“There were a whole host of watchstanders that failed to recognize the sensor data that was presented to them,” he said. Lessons learned are already being integrated into submariner training, he added.

### **Arctic Submarine Reporting Stirs Memories at SSC Pacific**

*By Tom LaPuzza, Navy News, October 28, 2009*

SAN DIEGO – When USS Annapolis (SSN-760) surfaced in the Arctic earlier this month, it brought back fond memories for some employees at Space and Naval Warfare Systems Center Pacific (SSC Pacific).

The Navy’s capability to operate its submarines in the Arctic is the direct result of pioneering work more than 60 years ago at SSC Pacific, then called the U.S. Navy Electronics Laboratory (NEL).

NEL’s Dr. Waldo Lyon, during his lifetime the world’s foremost Arctic expert, made the sensational, and generally disbelieved, claim in 1948, “The reality of a polar submarine that can navigate the entire Arctic Ocean is not only admissible, but may be an immediate practicality.”

In less than 10 years, with Lyon aboard as ice pilot, USS Nautilus (SSN-571) steamed from the Pacific to the Atlantic, passing not only underwater but under ice through the geographic North Pole on August 3, 1958. That was possible because Lyon and his associates at the NEL Arctic Submarine Laboratory designed and built an under-ice sonar and an upside-down fathometer (basically the standard model, but inverted and placed on the submarine’s sail to determine how close the ice canopy was overhead).

The team also built a sea-ice cryostat, where they could grow “true” sea ice with appropriate brine content and practice surfacing a one-quarter scale model submarine sail through the ice. That led, a year later in 1959, to Lyon’s return to the Arctic aboard USS Skate (SSN 578) and its surfacing through the ice at the North Pole, and to many subsequent under-ice operations. The “ice camps” run by Lyon’s lab every year gathered the scientific data that was his real interest.

Several current SSC employees are ice camp veterans. Diane Seltzer, Lyon’s administrative assistant for 10 years, who now works in the SSC Pacific Public Affairs Office, provided ground-crew support to the 1994 ICEX, but only spent a few hours on the ice.

In 1999, she was asked if she’d like to do the cooking for the camp crew; she jumped at the opportunity. “You don’t turn down those kinds of life experiences,” she said, despite facing the challenge of feeding as many as 40. She gathered appropriate recipes and with assistance from the camp support contractor did all the “shopping” required. She was soon standing in the ice camp mess hall in front of the stove, where the temperature at boot level was 32 degrees, and at head level 72. She spent 18 days on the ice.

All in all, she said, it was “fabulous. I’d do it again in a heartbeat. How many people can say they were standing on an ice floe, feeling it move underfoot as the submarine USS Hawkbill surfaced through the ice a few feet away?”

Another ice camp veteran is Gary Wang, who as a young Navy scientist participated in the 1985 ICEX. He is now a Senior Executive Service (SES) manager, serving as SSC Pacific’s director of Science, Technology and Engineering.

Ken Register, who currently heads a division that develops tactical data links, was an engineer working on anti-submarine torpedoes when he participated in ICEX 1-86. High point of that exercise was the first rendezvous of three submarines at the North Pole-USS Ray (SSN-653), USS Hawkbill (SSN-666) and USS Archerfish (SSN-678). Register, who tested torpedo performance in the frigid water, was one of 17 SSC Pacific employees who earned the Meritorious Unit Commendation for that effort.

The arctic lab, still operating in San Diego and located near SSC Pacific, is now part of the Naval Undersea Warfare Center Keyport Division.

### **Russian Sub Fails To Launch Missile**

*The News International, October 30, 2009*

MOSCOW: Russia’s latest test of its next-generation Bulava missile was aborted when a submarine failed to carry out the launch, in a fresh setback for the project, the Interfax news agency reported on Thursday.

The Dmitry Donskoi, a nuclear-powered sub that had been due to test-fire a Bulava off Russia’s northern coast, returned to its White Sea base without having launched the missile, a source at the naval base told Interfax.

“The main task of the mission, the execution of the Bulava test launch, was not fulfilled,” the source was quoted as saying.

“There are many theories about the event but the reasons can only be announced after an analysis of what happened,” he added. The Bulava, the flagship project in Moscow’s efforts to revamp its ageing Soviet-era missile arsenal, has suffered a string of embarrassing failures, with seven out of 11 tests since 2005 ending unsuccessfully.

Nearly half of the Russian defence ministry’s purchasing budget is devoted to the Bulava programme, according to Russian media reports.

### **Lockheed: New Sub Communications System Will Be Ready By 2011**

*By Cid Standifer, Inside the Navy, November 2, 2009*

Lockheed Martin is one step closer to delivering an enhanced submarine communications capability that will allow subs to talk with aircraft and ships on-demand.

The Communications at Speed and Depth program seeks to enable submarines to communicate without slowing down or coming up to periscope depth. The components currently under development by Lockheed include two varieties of tethered expendable communication buoys, TECB iridium and TECB ultra-high frequency, which would be connected to submarines with fiber optic cables, and acoustic to RF gateways, which would communicate with submarines acoustically, then translate signals into radio waves for transmission elsewhere.

The program recently completed a preliminary design review, paving the way for a critical design review by early next year.

Rod Reints, CSD senior program manager for Lockheed, said the technologies incorporated in the systems are already well established.

“This isn’t new as far as using that method to communicate with submarines,” said Reints. “What’s new is being able to do it in two-way and at the demand of the submarine, and be able to do it with a buoy that connects to either aircraft or ships or satellite which go to shore equipment. That whole path is the new part.”

Reints said the testing involved launching the Acoustic-to-RF gateway out of a submarine’s trash disposal unit, while the TECB buoys were deployed from ejection launchers. The buoys then floated to the surface where they opened flotation bags and prepared to transmit signals from the submarine.

Brent Starr, the program manager who oversees the effort for the Navy said that the program allowed the Navy to test the physics involved in those launches, as well as the technical aspects of using fiber optic cables, which could prove useful in future programs.

Now that the preliminary design review has verified that the proposed designs meet the Navy’s requirements, the next review will examine the system’s details. A finished product will be ready in fiscal year 2011, Reints said.

Starr said he expects building to start in fiscal year 2013.

“Between those three different systems, right now we have designs in place, but we haven’t started building all the sub-assemblies required, and there’s also infrastructure equipment in the shore and on the submarine to control those buoys,” he said. “All of those different parts of the system have to be built up and tested. We have to have detailed schematic drawings and we have to have test plans in place in order to verify to the customer that this equipment’s going to be satisfactory.”

Reints said the program is still on time and on budget, with a contract expected to cost up to \$177.9 million, including all production-phase options.

### **Indian Navy To Procure Five Midget Submarines**

*Domain-B, November 2, 2009*

New Delhi: The Indian Navy is planning to procure five midget submarines for its Marine Commandos (MARCOS) component. The midgets will strengthen the MARCOS ability to carry out special underwater operations in high seas.

Weighing less than 150 tonnes the submarines are classified as midgets and are used by navies to carry out underwater covert operations and surveillance missions.

According to defence ministry sources, the Indian Navy has already initiated the process of procuring these vessels.

With capacity of carrying four to six personnel on board, the submarines would have a diving depth of around 400 metres.

The midgets will have the capability of carrying out both manned and unmanned operations and will be equipped with a host of weapons including torpedoes.

The Indian Navy currently maintains a fleet of diesel-electric submarines. It has also signed a deal for six Scorpene submarines which will begin joining the Indian Navy from 2012 onwards.

The first of the country’s indigenously designed and built nuclear-powered submarines of the Arihant class are expected to be commissioned starting 2011.

India will also induct a Russian Akula-II class nuclear attack submarine on lease sometime in the second quarter of 2010. It is conjectured that India may have struck deal for the supply of two of these submarines for an amount of \$2 billion. At the end of the lease period India retains an option to buy them.

### **US Unbowed On Spying Off China's Coast**

No let-up in naval surveillance that Beijing calls 'major obstacle'  
By Greg Torode, *South China Morning Post*, November 1, 2009

US naval commanders have vowed to continue surveillance in parts of the South China Sea claimed by China as its exclusive economic zone, despite a new warning from Beijing that such activity represents a "major obstacle" to improved military relations.

Rear Admiral Kevin Donegan, commander of the US navy's Seventh Fleet battle force, based in Japan, said the US would continue to patrol "international waters" of the South China Sea, saying this was vital to the freedom of trade routes.

When asked specifically about the future operation of oceanographic and surveillance ships, such as the USNS Impeccable, that China has previously attempted to stop in the disputed areas of the South China Sea, he said: "Absolutely, we will continue to operate in international waters ... we will operate in areas that we're allowed to operate in."

The definition of international waters, he said, was "pretty well defined by the international community and by international laws. We will not infringe on other people's territorial seas."

He said he did not want to comment on surveillance work specifically, but expressed fresh concern about China's "unprecedented" military build-up and said it was important for the stability of the region that the US and other regional nations better understood Beijing's intentions.

Issuing a plea for greater co-operation and exchanges with the PLA, Donegan said recent improvements in communication were positive but more work would be needed to limit the risk of future misunderstanding. Donegan was talking in Hong Kong on Friday during a port visit by the aircraft carrier USS George Washington and support ships – a day after the end of a week-long visit to Washington by second-ranking PLA officer General Xu Caihou.

In meetings with US Defence Secretary Dr Robert Gates at the Pentagon, Xu agreed to seven steps towards what Washington hopes will be steadier military relations, but also highlighted four "major obstacles" – US military support for Taiwan, the presence of US surveillance ships in waters Beijing considers part of its exclusive economic zone, a lack of mutual trust and legal barriers for mutual exchanges.

Tensions are growing in the South China Sea as China increases submarine patrols from a new base on Hainan Island which the US navy and other claimants to the sea, such as Vietnam, are watching intently.

Despite having long stayed on the sidelines of South China Sea disputes, Washington is watching the area more closely, having voiced concerns over China's pressuring of US oil firms involved in oil exploration with the Philippines and Vietnam. Both Vietnam and China claim the sea's Paracel and Spratly islands in their entirety, while Malaysia, the Philippines and Brunei lay claim to parts of the Spratlys.

Potentially rich in oil and gas deposits, these islands lie on shipping lanes between Europe and Asia along which much of China's and Japan's oil supplies pass. China formalised its claim to much of the sea earlier this year under the UN Convention on the Law of the Sea – claiming an area with borders close to the expansive "historic line" shown on People's Liberation Army naval charts.

Even while US officials such as Donegan avoid getting involved in territorial disputes – calling only for eventual peaceful, political solutions – his comments do highlight stark differences in interpretation between the US and China.

The US and other regional powers believe that unauthorised fishing or exploitation of the seabed is prohibited within a state's exclusive economic zone (EEZ) but that it remains open to all other regular foreign commercial and military traffic – including routine surveillance work – meaning such zones can effectively be viewed as "international waters". Both the Soviet Union and the US regularly carried out surveillance within each other's EEZs during the cold war, for example.

China, however, is determined to limit surveillance operations, as Xu made clear last week.

Military analysts and diplomats believe the situation could degenerate over the next 18 months or so as China launches eight new submarines capable of carrying intercontinental ballistic missiles.

The US can be expected to deploy slow-moving surveillance ships such as the Impeccable, which tow powerful underwater sonar equipment, to gather information on individual submarines and to help its own submarine operations.

The unarmed Impeccable was confronted by Chinese civilian ships in March and forced to stop briefly as it attempted to leave waters between Hainan and Vietnam. The Pentagon later sent a warship to the area. "Hainan is vital for China to get its submarines out discreetly into the Pacific," said an Asian military attaché. "The US knows this and wants to develop a "sonar signature" for every Chinese submarine ... so the race is on."

A senior Pentagon official told the US Congress recently that "as the PLA has upgraded its facilities on Hainan Island, for example, we see a direct correlation with [Chinese] assertiveness in its reaction to the US surface and air activity".

Professor Carl Thayer, a regional analyst at the Australian Defence Force Academy, said there was little sign of either side backing down in the short term. "We can see the US taking a stick-and-carrot approach to China over its rights in the South China Sea," he said. "But China is clever with its objections ... it has put the US on notice and Washington will have to think harder

### **The Chinese Navy Is Going Blue Water**

By Xiaoxiong Yi, *Zanesville Times Recorder*, November 4, 2009

Harvard historian Paul Kennedy, in his "The Rise and Fall of Navies," wrote, "Those faster-growing economies can afford both guns and butter." China's tremendous economic growth has been accompanied by a quantum leap in China's naval build-up.

Today, more than 1,000 Chinese commercial ships and oil tankers are sailing through troubled waters every day, and China's commercial sea-borne trade volumes have escalated dramatically. China's commercial maritime interests exceeded \$800 billion by the end of 2008, and more than 60 percent of its oil imports transported by sea.

As Chinese cargo ships and oil tankers are becoming all the time more vulnerable on the high seas, Beijing sees it as vital to safeguard China's sea-lanes. Last week, the Chinese government vowed to make "all-out efforts" to rescue De Xin Hai, the Chinese ship hijacked by Somali pirates in the Indian Ocean northeast of the Seychelles.

What is perhaps more important, however, is Beijing's political-strategic ambitions. Chinese rulers are good students of the late Chairman Mao, who once said, "Power of government comes out of the barrel of gun." As Chinese rulers are becoming more

confident and assertive, to modernize China's People's Liberation Army (PLA), especially the PLA Navy (PLAN), has become one of Beijing's top priorities.

China's defense spending has increased by an average of 16.2 percent a year since 1999. It now is the second-highest in the world. The PLA's official military budget for 2009 is at \$70 billion, but the U.S. published estimates show that China's military spending as high as \$150 billion. In its first annual report to Congress under the Obama administration, the Pentagon has charged China with hiding its real military spending and expressed concern over why China would increase its military expenditure with no apparent external threats. "China's failure to be transparent about its rapidly growing military capabilities," according to the report, "has created uncertainty and risks of miscalculation. Much uncertainty surrounds China's future course, particularly regarding how its expanding military power might be used."

A major factor that contributes to China's rapidly growing military expenditure is Beijing's long-harbored ambition of possessing a blue-water navy, not only to safeguard China's commercial sea-lanes, but also to advance China's off-shore territorial claims. Such considerations have ensured the PLAN to receive top priority in China's military modernization, with a generous budgetary allocation estimated at more than 30 percent of the PLA's total defense budget.

To build a blue water navy, no expense has been spared. Earlier this year, Chinese defense minister Liang Guanglie confirmed Beijing's plan to build a new generation of large destroyers and aircraft carrier. From the Yellow Sea to the South China Sea, Chinese shipyards are running flat out. According to the U.S. Congressional Research Service, "By 2010 China's submarine force will be nearly double the size of the U.S., and the entire Chinese naval fleet is projected to surpass the size of the U.S. fleet by 2015."

Strategically, China's leaders have long been saying that the Indian Ocean is not India's Ocean. Beijing's new "Pearl Necklace Strategy" is designed to put Chinese naval bases along the shores of the Indian Ocean, and the maritime routes to Malacca: Marao in the Maldives, Coco Island in Burma, Chittagong in Bangladesh and Gwadar in Pakistan. China also is creating coastal bases in Africa, now widely open to Chinese investment.

Beijing sees the Pacific to be the next major strategic contending field in coming decades. Here, China foresees two rivals: Japan and the United States. Beijing has already tested Tokyo's readiness by repeated submarine incursions. PLAN vessels also are confronting U.S. Navy ships in the Pacific. The Chinese ships jostled with a U.S. Navy surveillance ship in the recent South China Sea confrontation sends a strong signal to countries in the region that they may no longer be able to depend on the U.S. in a conflict with China in the Pacific theater.

One hundred fifteen years ago, Qing Dynasty China's shiny new armada, North Sea Fleet, was crushed by the Japanese Imperial Navy in the Battle of Yalu. The humiliating defeat accelerated the decline of China. Today, China is flexing its new naval muscle at sea. The Chinese naval build-up still is in its early stages, and it may be years before Beijing has a navy to match that of the U.S., but the trend is clear: Beijing is determined to challenge American hegemony on the high seas and to re-address the postwar balance of power in the Pacific and Indian Ocean.

### **More Plutonium Reported Weaponized**

*Washington Post, November 4, 2009*

North Korea said Tuesday that it has weaponized more plutonium for atomic bombs, a day after warning Washington to agree quickly to direct talks or face the prospect of a growing North Korean nuclear arsenal.

The official Korean Central News Agency said North Korea had finished reprocessing 8,000 spent nuclear fuel rods, which experts say would provide enough weapons-grade plutonium for at least one more nuclear bomb. North Korea's assertion may not mean much, because the country is thought to already have enough weaponized plutonium for half a dozen nuclear weapons. But the timing — a day after Pyongyang's warning on expanding its arsenal — suggests that the communist regime is flexing its atomic might to push Washington to act, analysts said.

### **Antiwar Demonstrators Cut Fence At Sub Base**

*The Associated Press, November 4, 2009*

BANGOR, Wash. - Five anti-war demonstrators were arrested after cutting through a security fence at the nuclear missile storage facility for Trident submarines at Naval Base Kitsap-Bangor.

The Kitsap Sun reports they carried a banner that said, "Disarm Now Plowshares: Trident: Illegal and Immoral."

Navy spokesman Chris Haley says an alarm went off when the group entered at 6:30 a.m. Monday, and they were arrested on suspicion of trespass and destruction of government property, cited and released.

The five are identified as 81-year-old Catholic priest Bill Bischel of Tacoma, 83-year-old nun Anne Montgomery of New York City, 65-year-old Susan Crane of Baltimore, 60-year-old Lynne Greenwald of Bremerton and 60-year-old Steve Kelly of Oakland, Calif.

### **ONR: Taking OA Approach To Run Multiple RF Bands Through A Single Aperture**

*By Geoff Fein, Defense Daily, November 6, 2009*

While much of the discussion about open architecture (OA) focuses on freeing up hardware and software, at the Office of Naval Research (ONR), they are in the midst of an effort to develop a system that can simultaneously run various radio frequency (RF) bands through a single aperture, according to a service official.

"Our interest is in operational systems being open," Bobby Junker, head, command, control, computers, communications, intelligence, surveillance and reconnaissance, told Defense Daily recently.

"I started working this issue when we did the Advanced Multifunction RF Concept (AMRFC)," he added.

What ONR is doing in AMRFC is focusing on how to make an aperture that can simultaneously do radar, communications, navigation, and electronic warfare (EW) using simultaneous, independent beams out of the same aperture, Junker said.

"We've done it. Now we have something called the Integrated Naval Prototype Integrated Topside, which is now working with [the Program Executive Office] IWS and PEO C4I, etc., to build Topside prototypes, and it's being done open," he said.

Junker said when he first raised the idea of AMRFC back in the late 1990s, the traditional prime contractors resoundingly told him this idea wasn't within their business plans.

"What I told them was the Navy can't afford their business plan," he said.

But there are advantages to industry in considering this approach, Junker noted.

“They’d never lose a contract. If it’s open, you may not win the initial layout but when it comes to maintenance, when it comes to upgrades, you are still a player,” he said. “So, there are advantages to industry participation.” Eventually, industry came around, Junker added. “The part that was difficult then was to lay out a strategy whereby we would do this.”

The initial prototype effort began in the 1999-2000 time frame and was completed in 2004, he said.

While the prototype wasn’t an OA system, Junker noted it was at a relatively high level. “You had a receive aperture that was one subsystem, you had a transmit aperture that was another subsystem. It had well defined interfaces with all of the processing guts...control.”

“What I wanted was the ability to go a step lower on the apertures,” Junker said. “I wanted to go to at least sub apertures if not modules.”

Three years ago, ONR brought in the National Defense Industrial Association and together the two organizations formed a working group made up of representatives from industry and the Navy, he said.

Within the working group emerged four to five sub groups, Junker said. One was an oversight group, co-chaired by Raytheon [RTN] and the Naval Research Lab (NRL).

The oversight group was a critical component, he added. “What they did was come up with a construct for basically breaking down the system.”

“When we break down the system, it’s more than just an aperture,” Junker said. “It’s spectrum too.”

He added that the Navy likes to operate from high frequency (HF) through at least 40 to 45 GHz. “And I can do that in one aperture.”

“So part of this is actively defining how we go across this chunk of spectrum,” Junker said. “What came out was this overall construct for the architecture. And then what we did was, we put out an IDIQ contract. The first real task on that was the architectural design for these multifunction apertures.”

ONR developed an agreement with industry that said different companies would come in and bid on this contract and ONR would support the ones the organization thought were really strong. Junker said there are about six industries that have contracts for task number one.

“Overall there are 18 different companies under the IDIQ, but some of them are supplier type companies,” he said. “It’s a complex but flexible environment that we can work with.”

The agreement also noted that industry could come in with their proposed designs and then the Navy can evaluate them and pick and choose the parts and subsystems that the service thinks are the best, Junker said. “And the companies have agreed that anything that we choose, any subsystem that we choose, then becomes an open standard.”

For those efforts that are not selected, the company can keep its platform, he added. “But what is selected is then open. So the advantage is to the company. If they are selected, they have a huge jump ahead, but over time other companies can come up to speed.”

ONR is in the midst of implementing the strategy, Junker said.

There are going to be multiple prototypes, he added. “Right now we have the task order out for this initial design of the first one which is going to be an integrated EW, communications, and probably intel aperture from somewhere in the 3 to 5 GHz to probably somewhere in 20 to 22 GHz,” Junker said. “So it is a very wide band aperture.”

ONR and NRL have a working prototype, the AMRFC test-bed, at NRL’s Chesapeake Bay Detachment Test facility, he added. “It operates from around 5 to 18 to 20 GHz. But this was built on technology from 2000 and before...[it’s a] huge monster thing.”

ONR now has an electronics program that operates on an annual budget of approximately \$20 million. Junker said when it gets right down to it, with any RF system, what can be done depends on the electronic technology.

“If you don’t have the capability in electronic components, you are not going to do it,” he said. “We recognized early on we had to have a healthy electronics development program along with any prototyping we do.”

While Junker acknowledges that early on it may be the initial contract awards that get in and get a jump on work, it certainly will be open in the future for others to participate.

In fact, Junker said ONR has already demonstrated that. “There is a program we had that supported in DDG-1000 called the Multi Function EW.”

“It was multi-function, but it was just confined to EW,” he said. “It was a subset of the EW program. The prototype was done by Northrop Grumman. We funded DRS to build one of the subsystems just to [demonstrate] this. Those are things that we have done moving along that path.”

### **High Fissile Fuel In Nuclear Submarine Lasts Long**

*Pakistan Defence Forum, November 5, 2009*

Every year, on October 30, scientists, engineers and other officials from the Department of Atomic Energy gather near the Central Complex Building, Trombay to celebrate the Founder’s Day. Being the Birth Centenary year of Dr. Homi Bhabha, this year’s celebration was unique. The stock taking of the research and development activities at the Bhabha Atomic Research Centre (BARC) covered compact reactor for Arihant (the nuclear submarine), improved gas centrifuges for uranium enrichment, fuel fabrication for fast reactors and work on innovative reactors among other areas in the cutting edge of technologies.

BARC designed, developed and built the steam generating unit of Arihant by facing many technical challenges

“The compact Pressurized Water Reactor was designed for this purpose with several features; such as very quick response for power ramping, extremely stable undersea motions and resistance against exposure to very high acceleration resulting from eventual depth charges”, Dr Sukumar Banerjee, Director, BARC said in his Founder’s Day Address

“Since the nuclear reactor is fuelled with high fissile containing fuel, it can supply energy in the submerged condition for an extended period without refuelling”, he clarified. Details about the reactor are classified.

Generally, Pressurized Water Reactors (PWR) power nuclear submarines. A PWR has a core of highly enriched uranium. When uranium nuclei undergo fission, the fission fragments carry enormous energy. They dissipate the energy in the core which gets heated up. The high pressure primary system with water as coolant removes the heat from the core continuously.

Water at high temperature enters the steam generators. In the steam generators, the heat from the water in the primary system is transferred to the secondary system to create steam. In the secondary system, the steam flows from the steam generators to drive the turbine generators, which supply the ship with electricity, and to the main propulsion turbines, which drive the propeller. After passing through the turbines, the steam condenses into water which is fed back to the steam generators by the feed pumps.

Naval reactors pitch and roll. Demands of power change rapidly. The manufacturing and quality assurance of reactor components must be of exceptionally high standard.

The reactor internals remain inaccessible for inspection or replacement throughout the long life of their core. They must be rugged and resilient. Reactor components and systems must withstand, harsh and hostile environment, long term effects of radiation, corrosion, high temperature and pressure.

As the reactor operates radiation level increases. Appropriate shields are built around the reactors to ensure radiation safety. A reactor may use over 100 tons of lead as shielding.

“Many systems and equipment designed and built were first of its kind in the country. The entire steam generating plant has been designed to give highly reliable offshore operation in a completely isolated environment”, Dr Banerjee noted.

“Control and instrumentation design is fault tolerant and requires minimum operator interventions. An elaborate diagnostic system enables a very high availability factor. Many new materials and technologies have been developed and new infrastructure has been created for this project”, he revealed.

#### Prototype system

The development of the steam generating plant of Arihant was preceded by setting up of the land based prototype system at Kalpakkam. The reactor which has been working for the past three years has served as a technology demonstrator.

“The entire plant with primary, secondary, electrical and propulsion system along with its integrated control was packed in the aft end of a land based submarine hull designed and built specifically for the purpose.

This prototype is serving as a training centre for the crew for the nuclear submarine”, Dr Banerjee said. The crew gets training with the help of an indigenously designed and built full scope simulator.

### Convention Photos by Jack Kane













United States Submarine Veteran's Inc.

## Submarine Film Festival

Date: Saturday, 12 Sep 2009

Time: 1300 - 1600

Location: Royal Palm Salon 2-5









