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The Silent Sentinel

SEPTEMBER 2012

Our Creed and Purpose

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 toward greater accomplishments. Pledge loyalty and patriotism to the United States of America and its Constitution.

In addition to perpetuating the memory of departed shipmates, we shall provide a way for all Submariners to gather for the mutual benefit and enjoyment. Our common heritage as Submariners shall be Strengthened by camaraderie. We support a strong U.S. Submarine Force.

The organization will engage in various projects and deeds that will bring about the perpetual remembrance of those shipmates who have given the supreme sacrifice. The organization will also endeavor to educate all third parties it comes in contact with about the services our submarine brothers performed and how their sacrifices made possible the freedom and lifestyle we enjoy today.

USSVI ELECTION RESULTS

2012-2014 National Officers
Commander: Michael Bircumshaw
Sr Vice Commander: Carl Schmidt
Jr Vice Commander: Al Singleman, Jr
Secretary: Tom Conlon
Treasurer Richard McPherson

2012-2014 Region Directors
Northeast Director: Michael Naughton
Southeast Director: Dick Kanning
Central Director: Wayne Standerfer
Western Director: John Mansfield

2012-2013 District Commander of the year: Vic Van Horn
2012-2014 Immediate Past Natl Cdr: Patrick Householder

All the proposed amendments were Accepted.

2013 Convention: Rochester MN
2014 Convention: Burlingame CA (SFO Area)

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Position Open

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.

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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*

SEPTEMBER Meeting

Our monthly meeting is held on the second Tuesday of the month at VFW Post 3787, 4370 Twain Ave., San Diego. Our next meeting will be on 11 September, 2012. 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
Al Strunk

Submarine Losses in August

Originally Compiled by C J Glassford

GRUNION (SS 216) - 70 Men on Board:
Sunk, on 16 Aug 1942, by Gunfire from Torpedoed Japanese Transport, 10 Miles North of Segula, near Kiska Island, Aleutians : " ALL HANDS LOST "

S – 39 (SS 144) - 46 Men on Board:
Destroyed, on 16 Aug 1942, after Running Aground on a Reef, South of Rossel Island : " NO LOSS OF LIFE "

BASS (SS 164) - 51 Men on Board:
Fire in After Battery Room, on 17 Aug 1942, Asphyxiates part of the Crew : " 25 MEN LOST "

POMPANO (SS181) - 76 Men on Board:
Sunk, on 29 Aug 1943, Causes unknown, Possibly a Japanese Mine, or combined Air and Surface Attack, off Northeastern Honshu, Japan : " ALL HANDS LOST "

FLIER (SS 250) - 80 Men on Board:
Sunk, on13 Aug 1944, by a Japanese Mine, South of

Palawan, in the Balabac Strait :
" 78 MEN LOST – 8 SURVIVORS "

HARDER (SS 257) - 79 Men on Board:
Sunk, on 24 August 1944, by Japanese Coastal Vessel, Off the West Coast of Luzon, Philippines
" ALL HANDS LOST "

BULLHEAD (SS 332) - 84 Men on Board:
Probably Sunk, on 6 Aug 1945, by Japanese Army Aircraft, off the Bali Coast, in East Java Sea. * Last Submarine Sunk During World War Two : " ALL HANDS LOST "

COCHINO (SS345) - 68 Men on Board:
Foundered and Sank, on 26 Aug1949, Caused by After Battery Explosion and Fire, During a Severe Storm off the Northern Coast of Norway : " 1 MAN LOST "

TUSK (SS 426) - 81 Men on Board:
Six Crew Members washed Overboard, on 26 August 1949, while trying to rescue Crew Members of Fire damaged USS COCHINO (SS 345), in the Norwegian Sea:
" SIX MEN LOST "

Minutes, Sailing List. Commander's Comments--not received on acocunt of the USSVI Convention

CHANGES TO SENTINEL DELIVERY: YOU MUST READ THIS!

The officers of San Diego Base realize that a very small number Silent Sentinel readers do not have any access to the Internet. So before we go any further, I want you non computer folks to know that the paper version of the Sentinel will still be provided to you via the U.S. mail. Over the years, some of you non computer folks have written to me saying how much you look forward to receiving the Silent Sentinel every month, expressing thanks for still receiving it in a paper version. At the same time, each and every one of you fellows who have written me, have also made it very clear that you do not have a computer and that unless you are provided monthly with a paper copy of the Silent Sentinel, you would not have any copy at all.

Guys, rest assured that the officers of San Diego Base, the base membership, and the editor of the Silent Sentinel —namely, me—appreciates each and every one of you, our fellow shipmates; and that unlike the plethora of entities, principalities, powers, and agencies filling today's world—with usefulness and quality levels *inversely* proportional to their financial intakes—we here at San Diego Base will not forsake any of you non computer guys on account of the almighty dollar. Still, the costs of producing a paper newsletter are excessive, rising every day, and something needs to be done to fix it.

Consequently, this is the plan. If you honestly do not have access to a computer, then please write

me—even if you have done so before—with the words: "I do not have access to a computer. I need the Sentinel paper copy via the U.S. mail" (make sure that you include your correct mailing address)—and you'll continue to get your copy in the U.S. mail without interruption.

On the other hand, if you do indeed have access to a computer—and can receive the Sentinel as an email attachment (or as a download via the San Diego Base website)—then I will need from you an email address in order to send you the electronic version.

If you are receiving the Silent Sentinel electronically already, then you need not do anything.

Guys, keep in mind that I am taking each of you at your word as a qualified submariner concernng this matter. And please also note that this whole thing is not for my personal benefit (it's the same amount of work for me—hardcopy or electronic); rather, this is all for your shipmates who have no other way in which to receive the Silent Sentinel other than by the U.S. mail.

Please note that the December 2012 edition will be the last hardcopy version of the Silent Sentinel other than the small number of Sentinels which will continue to be printed for you folks without any computer access.

Please do not delay in getting back to me on this. If you receive the Sentinel by U.S. mail, I absolutely must hear back from you!

My address follows:

Mike HYMAN
3639 Midway Drive, B-320
San Diego, CA 92110-5254\

Thanks,

Mike Hyman, Editor

New Commander Takes Over Navy's Submarine Forces

By Mike Hixenbaugh, The Virginian-Pilot, Sept 8, 2012

The Navy has a new top commander guiding its submarine forces.

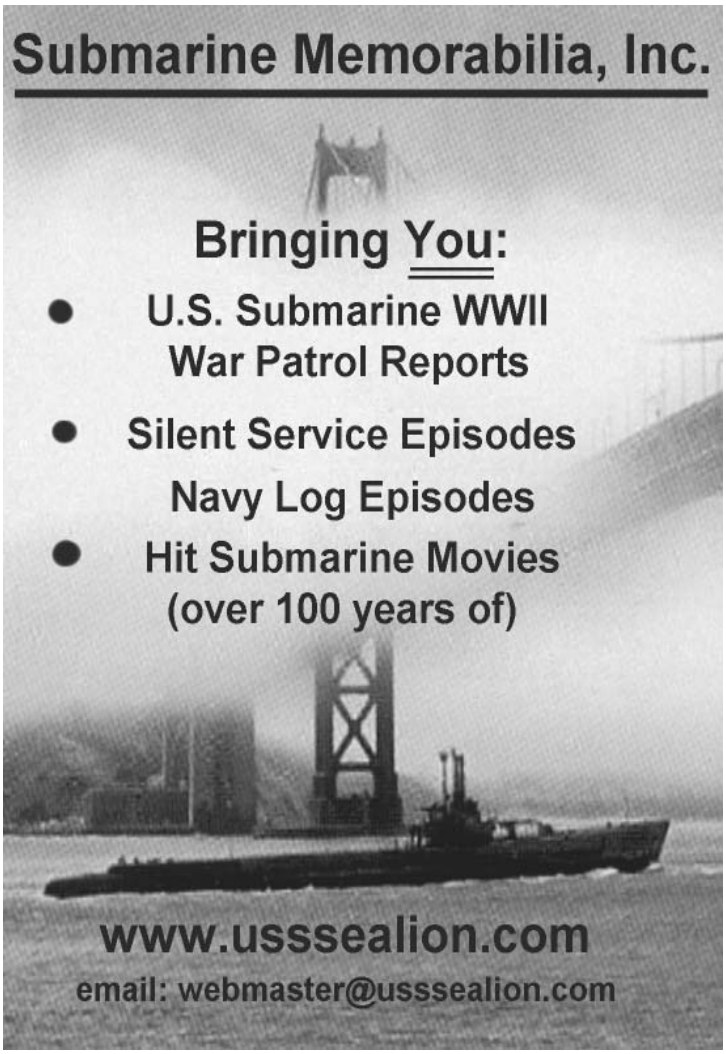
Vice Adm. Michael Connor relieved Vice Adm. John Richardson at a ceremony Friday atop the attack submarine New Mexico at Norfolk Naval Station.

During his two-year tenure, Richardson integrated women into the Navy's submarine force and sought to decentralize authority, giving submarine commanders more flexibility.

Richardson said those changes increased the Navy's war readiness.

"Our business is war fighting and preparing for war," Richardson said from a stage on top of the submarine. "Our hope is that by doing that business in a very convincing way - by becoming masters of the undersea domain - we will deter anybody from taking us on."

Richardson will lead the Naval Nuclear Propulsion Program.



Connor, who previously served as assistant deputy chief of naval operations for warfare systems, is now the Navy's top submarine commander and will directly manage the force's Atlantic Fleet. He also will serve as commander of NATO's Allied Submarine Command.

Adm. John C. Harvey Jr., head of Fleet Forces Command, thanked Richardson for his leadership and welcomed Connor to what he called one of the Navy's most important responsibilities.

"These boats and these sailors are truly the asymmetric advantage our Navy has in the maritime domain," Harvey said. "No nation's navy can touch our submarine force, and every nation's navy knows it." Several former seamen who were in town for the U.S. Submarine Veterans National Convention, including a few World War II veterans, attended the change of command.

Nuclear Submarine Fire Sparks Two Navy Probes

Investigators aim to learn why the blaze spread so fast and to find ways to reduce in-dock hazards

By David Sharp, Associated Press, Sept 10, 2012

KITTERY, Maine — Setting sail aboard a nuclear-powered submarine that can travel deep underwater at speeds topping 30 mph with complicated equipment and an arsenal of weapons has inherent danger. But there's potential for a bigger risk when the sub is in dock for major work.

Submarines that are being overhauled, like the USS Miami, which suffered $450 million in damage in a fire in May, are often crowded with shipyard workers and equipment. Temporary systems are established and there are cables running throughout the sub. Deck plating is sometimes removed, creating holes in passageways.

"Submarines face different dangers, perhaps bigger ones, when they're being overhauled or repaired in an industrial setting," said Peter Bowman, a retired Navy captain and former Portsmouth Naval Shipyard commander.

On the USS Miami, those who battled the fire that started May 23 said it knocked out lighting, and a crew member broke ribs when he fell into a hole.

It took the efforts of more than 100 firefighters to save the USS Miami in dry dock at Portsmouth Naval Shipyard after a civilian shipyard worker allegedly set a fire that quickly spread through its forward compartments.

Two Navy panels are continuing wide-ranging investigations aimed at identifying factors that contributed to the rapid spread of the fire as well as ways to reduce hazards and improve firefighting response in the future.

The Navy hopes to complete the investigations by month's end.

Bowman and Jerry Holland, a retired Navy rear admiral and submarine commander, said that an industrial setting exposes submarines to hazards that normally wouldn't be present at sea, when the ship's entire crew is present and all equipment and systems are in shipshape and in full operating order.

Some of the most serious ship and submarine calamities in U.S. naval history have happened with a vessel at dock, in construction or under repair.

In 1960, another nuclear-powered submarine, USS Sargo, suffered serious damage and the loss of one crew member during an oxygen fire at Pearl Harbor in Hawaii. And 50 shipyard workers died when the aircraft carrier Constellation caught fire during construction at Brooklyn Naval Shipyard later that year in New York.

The submarine Guitarro sank during construction in 1969 at Mare Island Naval Shipyard in California; watertight doors and hatches couldn't be closed because of cables and hoses.

Minor problems can become big problems when a vessel's sophisticated damage control systems are offline, said Norman Polmar, a naval analyst and author.

"When the sub is not operational, you can't count on the normal tried-and-tested damage control, firefighting and other safety systems," Polmar said.

In the case of the USS Miami, firefighters reported that going into the sub was like stepping into a blast furnace, and a forensic study concluded that the temperature may have hit 1,000 degrees in areas, the Navy told the Associated Press.

The pressure hull was subjected to less heat, with isolated areas hitting 700 degrees. "However, for the most part, the hull was not exposed to temperatures above 350 degrees," said Dale Eng, a Navy spokesman.

The Navy intends to repair the submarine, which is based in Groton, Conn., with a goal of returning it to service in 2015.

Former shipyard worker Casey James Fury of Portsmouth, who's accused of setting the fire, remains held without bail while awaiting trial in federal court in Portland.

Fury told Navy investigators that he set the fire because he was feeling anxiety and wanted to go home.

The criminal case could have bearing on the release of the Navy's findings.

While investigators hope to complete their work by month's end, they won't make their findings public if it interferes with the criminal case, said Pat Dolan, spokeswoman for the Navy Sea Systems Command.

To Smuggle More Drugs, Traffickers Go Under The Sea

By Michael S. Schmidt and Thom Shanker, New York Times, Sept 10, 2012

KEY WEST, Fla. — For more than 24 hours last September, a Coast Guard helicopter and speedboat pursued drug traffickers and their contraband across the Caribbean Sea. Finally they caught up with the improbable vessel, the latest innovation in the decades-old drug war. It was a submarine.

The low-slung, diesel-propelled vessel, painted a dark shade to blend with the water, was believed to be carrying several tons of cocaine. But after the submersible's crew scuttled the vessel and abandoned ship, the Coast Guard was able to salvage only two 66-pound bales of narcotics.

This is the new challenge faced by the United States and Latin American countries as narcotics organizations bankroll machine shops operating under cover of South America's triple-canopy jungles to build diesel-powered submarines that would be the envy of all but a few nations.

After years of detecting these craft in the less trafficked Pacific Ocean, officials have seen a spike in their use in the Caribbean over the last year. American authorities have discovered at least three models of a new and sophisticated drug-trafficking submarine capable of traveling completely underwater from South America to the coast of the United States.

The vessel involved in the September chase was an older model that was only semi-submersible. That model presents a silhouette above water barely larger than a kitchen table, but requires a snorkel to bring in air for the diesel engine, which has a range of about 3,000 miles. The three newer, fully submersible vessels already captured were capable of hauling 10 tons of cocaine and, by surfacing at night to charge their batteries off the onboard diesel engine, could sail beneath the surface all the way from Ecuador to Los Angeles.

With the use of these craft on the rise, American officials say they fear that the trafficking networks are moving away from so-called fast boats, the high-powered fishing and leisure boats that can carry about a ton of cocaine and are easier to spot, to semi-submersible and fully submersible vessels that can surreptitiously carry many more tons of drugs, which are unloaded in shallow waters or transported to shore by small boats.

More troubling for American officials is their belief that these vessels could be used by terrorists to transport attackers or weapons, though they emphasize that no use of submersibles by militants has been detected.

Drug networks historically were organized to combine the tasks of production, transportation and distribution, and they have seen little reason to cooperate with terrorists. But these new advanced submarines are built in some cases by independent contractors who may be more willing to sell the vessels to anybody offering the right price.

"These vessels are seaworthy enough that I have no doubt in my mind that if they had enough fuel, they could easily sail into a port in the United States," said Cmdr. Mark J. Fedor of the Coast Guard, who commands the cutter Mohawk, the 200-foot vessel whose fast boat and helicopter interdicted the submersible in the Caribbean last September.

In addition to the Coast Guard ships and aircraft patrolling the seas, the American effort includes a sophisticated command center that combines intelligence from across the United States government and from nations in the region, which are increasingly cooperating to battle cocaine trafficking.

This growing American counternarcotics effort is part of a larger shift to new missions for the nation's security and intelligence agencies after a decade spent focused on the conflicts in Iraq and Afghanistan.

That mission to sort and analyze intelligence on drug trafficking and then coordinate the response occurs around the clock behind the walls of an interagency task force in Key West, which sent the intelligence report to Commander Fedor's ship and coordinated its response.

The intelligence report, based on surveillance from a Coast Guard plane over the Caribbean and intelligence tidbits from nations in Latin America, said the submersible had left Colombia headed for Honduras.

Although the craft was 300 miles away, the Mohawk was the closest American vessel to it. So Commander Fedor immediately ordered his 100 crew members to direct the ship off Honduras to intercept the craft.

Cocaine-filled submarines and semi-submersible crafts "are the Super Bowl of counternarcotics," Commander Fedor said. "When you hear one is moving, you say: 'Wow. Game on.' "

After a day's travel, the cutter got within a few miles of the craft and deployed the cutter's fast boat and a helicopter.

Commander Fedor said that as they approached the submersible he was on the radio with the intelligence task force, getting up-to-the-second information on what the submersible was doing. He had similar conversations two weeks later as his ship was chasing another sophisticated submersible and had to fire on it to stop, a mission also set into motion by the intelligence fusion center in Key West.

Inside the command center, officially known as Joint Interagency Task Force-South, the Departments of Homeland Security, Justice, State and Defense are joined by intelligence agencies and liaison officers from more than a dozen nations to analyze threads of information on drug trafficking. The 600-person task force is in charge of cuing ships, aircraft and counternarcotics units on the ground for interdiction missions up and down the hemisphere.

The task force's commander, Rear Adm. Charles D. Michel of the Coast Guard, said that drug interdictions for 2012 are already up more than 50 percent from a year ago. He attributed that to a counternarcotics coalition assembled at Key West that is trying innovative and aggressive measures to cut off drug traffickers leaving South America.

The current mission, called Operation Martillo, focuses on setting up interdiction "boxes" in two zones off the coast of South America where the drugs start their voyage, and two more just offshore of the favored transshipment points in Honduras and Guatemala, where the drugs are divided up into smaller shipments and harder to track.

Admiral Michel said that while the task force consists mostly of Americans, the end game is "getting to prosecution," which requires working "by, with and through the local partners" in Central and South America.

In 2011, interdiction missions coordinated by the joint task force captured 129 tons of cocaine en route to the United States — more than five times the cocaine seized over the same period by operations in the United States, where agents and officers stopped about 24 tons of the drug.

Even so, three-quarters of potential drug shipments identified by the task force are not interdicted, simply because there are not enough ships and aircraft available for the missions. "My staff watches multi-ton loads go by," Admiral Michel said.

Joint Interagency Task Force-South has been one of the United States government's best-kept secrets, although it does exhibit a flair for dramatic symbolism — if you know what to look for.

Whenever the headquarters contributes intelligence to guide a mission that successfully interdicts a large cache of cocaine, a flag is raised in the yard. On the banner is a large image of a cocaine snowflake with a larger red "X" across the center.

Israel: Selling Subs To Egypt Endangers Us

Thelocal.de, Sept 4, 2012

Israeli defence experts have appealed against German plans to sell two modern submarines to Egypt, saying it would upset the balance of power in the Middle East.

Modernising the Egyptian submarine fleet would have "significant strategic effects," said Schlomo Brom, retired brigadier general, now an academic at Tel Aviv University.

The Financial Times Deutschland reported on Tuesday that a host of Israeli experts were speaking out against the deal.

"In the case of a conflict, they could threaten shipping to Israel's harbours, upon which we are completely dependent," said Brom. He said Israel would not be able to effectively defend itself against modern submarines.

The timing of the sale was particularly unfortunate, said Eli Shaked, former Israeli ambassador to Egypt. He said tension in the region was high enough as it was. "One should not increase it," he said.

Arms sales to the Middle East were, "always about the military balance of Israel and its Arabic environment," said Shimon Stein, former Israel ambassador to Germany. "We have been observing for a considerable time that the Egyptian army

is arming itself – but against which enemy? Libya and Sudan are certainly no threat."

The relationship between Germany and Israel has deteriorated dramatically recently, wrote Israel's biggest newspaper Jedioth Achronot this weekend. The sale of submarines to Egypt as announced last week by the head of Egypt's navy, was just part of a process that had been going on for years, the paper's Berlin correspondent Eldad Beck wrote.

"It begs the question what the government actually means when it talks of its special responsibility for Israel's security. It seems to be empty," he said.

Head of the parliamentary foreign affairs committee, Ruprecht Polenz, of Chancellor Merkel's Christian Democratic Party, has called for information from the government about the deal.

"We are talking here about a sensitive region, and the strategic security of Israel is in Germany's particular interest. Thus I would like to know how such a deal fits in with that," he told the FTD.

He said he could imagine there was good reason for it, but that the government had to explain how it did not affect Israel's security.

Government sources told the paper the Israelis had been consulted before the contract was signed with Egypt.

"We would never do anything which would endanger Israel's security," the source told the paper. It was also told that Israel has itself long had German Dolphin class submarines. And not only had the Israelis received significant financial subsidies for the six which it bought, they were far more advanced than the 209 class subs which Egypt wanted.

The Financial Times Deutschland said the government aimed to tie the Egyptian government into western alliances with the deal, saying that the new Egyptian leadership had so far maintained a "sensible" distance to Iran.

The Kieler Nachrichten newspaper reported that the two German submarines which are being built in the city's HDW shipyard, would be delivered in 2016.

Kara Sea as Nuclear Pandora box

By Grigory Milenin, The Voice of Russia, Sept 4, 2012

In the mid of the 20th century the Kara Sea became the main dumping area for radioactive wastes. The waters around the Novaya Zemlya archipelago cover thousands of containers with used nuclear fuel, almost 20 ships with radioactive materials. Also several nuclear reactors and a submarine were dumped there, which arouses concern of ecologists. In an interview with the "Voice of Russia" Vladlen Korobkin, academician of the Russian academy of natural sciences said there is a threat of radioactive contamination due to undertow streams.

"Earlier scientists thought that stirring of waters in the sea did not exist. That is why they thought that dumping wastes in the sea at the depth of several hundred meters would not do damage to the environment. But the stirring exists and gradually all the wastes will be brought to the water surface so we mustn't dump hazardous substances including radioactive wastes in the sea waters."

But the results of the recent studies remove the ecologists' concerns. We hear from deputy director of the Institute for Ocean Studies of the Russian Academy of Sciences Mikhail Flint.

"I should say that Russia's Emergency Ministry has been regularly studying the situation with radiation and the last study was conducted in 2007. It was a very detailed expedition including the inspection of the dumping sites in the northern part of the Novaya Zemlya archipelago, which had not been inspected before. No signs of leak of radioactive material were found."

The K-27 submarine was dumped in the Kara Sea in 1982 following a serious reactor accident. Before dumping the reactor unit was filled with a special solution which prevented leaks of radioactive material. In order to prevent contact of fissionable materials with sea water the unit was filled with 270 tons of bitumen.

Mikhail Flint sees political motives behind the plans of Norwegians to lift the submarine and to decommission it on the ground.

"There is a political component in it. Sometimes for political reasons people do the things they would never for pragmatic reasons. I think the main issue on the agenda is whether it is reasonable or not to invest money in it. Especially if it concerns the objects which integrity we can guarantee until they are lying on the sea bottom. If we begin to lift them we may face numerous technical and natural emergencies. The lifting technology is not flawless. I think there are political motives behind the intentions of the Norwegian experts."

Navy Makes Decision To Employ Up To Four Sonar Surveillance Systems

Inside the Navy, Aug. 31

The Navy has made a final decision to employ up to four sonar surveillance systems after weighing the operational, scientific, technical and environmental implications, according to a Federal Register notice issued last week.

The Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar will have certain geographical restrictions and monitoring designed to reduce potential adverse effects on the marine environment, the Aug. 30 notice reads. The SURTASS LFA relies on active radar, or sending out sound waves and listening for them to bounce back, which can help detect a submarine before it gets close enough to attack.

Environmental groups said in the past that active sonar could damage whales' and dolphins' hearing, disorienting them and leading to injury or death. They asked for strict rules about where and how the Navy could use sonar, first in a 2002 lawsuit and again 2007, and the court obliged in a series of decisions.

"The Secretary of the Navy and Chief of Naval Operations (CNO) have continually validated that Anti-Submarine Warfare (ASW) is a critical part of that mission — a mission that requires unfettered access to both the high seas and littorals," Joseph Ludovici, principal deputy assistant secretary of the Navy for energy, installations and environment, wrote in an Aug. 15 record of decision on the SURTASS system. "In order to be prepared for all potential threats, the Navy must maintain ASW core competency through continual training and operations in open-ocean and littoral environments."

Ludovici pointed out the rapidly growing number of submarines in both China and Russia means the U.S. ASW capability must meet more technologically-capable threats in a wider range of ocean environments. Submarines have gotten quieter over the past several decades and are therefore more difficult to locate using passive acoustic technologies that were effective during the Cold War.

"The range at which U.S. ASW assets are able to identify submarine threats is decreasing and, at the same time, improvements in torpedo design are extending the effective weapons range of those same threats," he added.

CNO: Women Aboard Attack Subs Next Year

Navy Times, Aug. 22

After years of anticipation, a date for assigning women to attack submarines has been set: next year.

Attack boats represent the next phase of the Navy's gradual integration of the submarine force, which began last year when female officers joined ballistic- and guided-missile subs. Chief of Naval Operations Adm. Jon Greenert told sailors recently that this new phase would begin as soon as next year, when female officers are assigned to Virginia-class subs.

"I think next year we're going to bring some officers into the Virginia class," Greenert said Aug. 22 at an all-hands call in New London, Conn.

So far, the fleet's first female submariners have fit well into billets on Ohio-class boomers and guided-missile boats. But with two dozen female officers entering submarines each year, officials are looking for more hulls and more opportunities. That's why they're moving to integrate the Virginia class, the Navy's latest class of attack boats. Recruiters are seeking talented female midshipmen for sub duty, but the number of volunteers has been lower than officials anticipated.

"They're not quite as high as we thought they'd be, frankly, in the officer ranks," said Greenert, who explained the integration effort will continue gradually, hewing to lessons from the earlier integration of ships and aviation squadrons, such as putting female officers onboard first and providing them with female mentors. But he hinted the Navy may soon start looking for female enlisted volunteers, too.

"What about the enlisted?" he asked. "We need chiefs and first class females that would be willing and ready to go into submarines." The CNO did not say when enlisted women may join the sub force, but his comments signaled it likely would be part of a later phase of the integration.

While attracting a lot of press coverage, women remain a very rare presence in the sub force. There were only 24 women assigned to boats as of Aug. 30, counting both female submarine officers and Supply Corps lieutenants serving as their mentors. They serve aboard the blue and gold crews of the ballistic-missile subs Wyoming and Maine and the guided-missile sub Ohio, as well as the gold crew of the guided-missile sub Georgia.

Five more crews are planned to be integrated in January: Georgia's blue crew, and blue and gold crews on the guided-missile sub Florida and ballistic-missile sub Louisiana. Sub leaders haven't selected which Virginia-class subs will be

integrated or planned specifically for when the first female crew members will report aboard them, a Submarine Forces spokeswoman said.

The next wave of 24 female submariners is now in the officer training pipeline, with 18 more waiting to enter after them, said Cmdr. Monica Rousselow.

A Nuclear Dimension To China's Maritime Claims

Singapore Straits Times, Sept. 3

The tug-of-war over the South China Sea is mainly seen as a struggle among rival claimants – China, Taiwan and several South-east Asian states – for control of valuable fisheries as well as seabed oil, natural gas and mineral resources.

China's claim to about 80 percent of the 3.5 million sq km sea and its hundreds of atolls, rocks and reefs has also alarmed outside seafaring and trading nations, including the United States and Japan. They regard the South China Sea as an international maritime highway, with free navigation for seaborne trade, unimpeded movement of naval vessels and over-flight rights for military aircraft.

But recent developments in China's nuclear weapons programme suggest that there is another important dimension to Beijing's increasing assertiveness in enforcing its claimed jurisdiction in the semi-enclosed sea: Protecting a new generation of nuclear-powered submarines armed with atomic warheads and based at Sanya on China's Hainan Island.

"Without understanding the nuclear dimension of the South China Sea disputes, China's maritime expansion makes little sense," said Mr Tetsuo Kotani, Special Research Fellow at Okazaki Institute in Tokyo.

One of the new-generation subs was first spotted at Sanya by a commercial satellite in 2008. It was tied to a pier that analysts said was China's first, and so far only, de-magnetising facility for submarines.

De-magnetisation is conducted before deployment to remove residual magnetic fields in the metal of a sub, making it harder for hostile submarines, surface ships and anti-submarine aircraft to detect.

Initially, these new-generation Chinese subs – and the nuclear-tipped ballistic missiles they could launch while submerged – would be able to target potential adversaries in Asia and U.S. bases in the region.

Eventually, with longer-range inter-continental missiles, they could cover the whole of the U.S. from launch points in the deep waters of the South China Sea, without having to venture too far from their rock shelter tunnels, bored into a mountain that forms part of the Sanya naval base for China's South Sea Fleet.

This would give China a more effective deterrent against nuclear attack – one that can operate from under the sea in addition to land-based nuclear missiles.

In recent years, China has built up a relatively small but increasingly impressive arsenal of approximately 140 nuclear ballistic missiles, either concealed in silos ormounted on special launch-vehicles and moved around to different hiding places on land.

Each carries a single nuclear warhead. But earlier last month, a newspaper controlled by the ruling Chinese Communist Party reported that China was developing the capability to do what Russia and the U.S. have done – put multiple warheads on its inter-continental ballistic missiles (ICBM), each capable of hitting different targets.

This could greatly increase the number of China's operational nuclear weapons and overwhelm any missile defence system.

At the same time, China is building a fleet of new JIN-class nuclear-powered ballistic missile submarines (SSBN), known as Type 094. Two are in operation, a third is under construction and may already have been launched, and at least two more are expected to be built.

Meanwhile, China is hoping to complete testing of the JL-2 nuclear-tipped missile for the Type 094 sub, which can carry 12 of the missiles.

The U.S. Defence Department's annual report to Congress in May on China's armed forces and military strategy noted that, while the JL-2 programme had faced repeated delays, it "may reach initial operating capability" within the next two years, giving the Chinese navy "its first credible sea-based nuclear" deterrent.

The JL-2 missile is estimated by the Pentagon to have a range of some 7,400km. This would enable a Type 094 SSBN, armed with the missiles and stationed in waters near China, to target the U.S. territories of Alaska and Guam in the western Pacific, and other American bases in the Asia-Pacific region, as well as India and most of Russia, including Moscow but not the continental U.S.

To reach the U.S. heartland from the South China Sea, the Chinese navy would either have to develop an extended-range nuclear ballistic missile, or send its Type 094 SSBNs through the Philippine or East China seas into the Pacific Ocean, through relatively narrow straits that form dangerous choke points for the subs, which may make them vulnerable to detection and attack in a crisis.

At present, China's longestrange land-launched ICBM can strike targets more than 13,000km from launch point.

A new Chinese ICBM, which some reports suggest was flight-tested in July, reportedly has a range of at least 14,000km.

While it may add a nuclear dimension to China's interests in the South China Sea, having a sea-based nuclear deterrent may pose serious control problems for the Central Military Commission (CMC), which supervises the country's nuclear arsenal.

The CMC and the Chinese navy have no experience in operating SSBNs in either peacetime or during a crisis.

Yet remaining submerged and out of communication for lengthy periods is essential if SSBNs are to remain undetected.

So for the foreseeable future, China's land-based nuclear missile force is expected to be the mainstay of the country's deterrent and retaliatory strike capability against the continental U.S. or other faraway targets.

But that will be cold comfort for any regional adversary of China, which might soon be targeted by a new SSBN fleet, armed with nuclear ballistic missiles.

The writer is a visiting senior research fellow at the Institute of South East Asian Studies.

Historic World War II submarine USS Cod assured of future home on Cleveland lakefront

Cleveland.com, Aug. 30

CLEVELAND, Ohio — Representatives of the USS Cod Submarine Memorial were assured by city officials Wednesday that the World War II vintage vessel will continue to be a valued part of Cleveland's lakefront, easing some concerns regarding the attraction's future.

Paul Farace, memorial director, has wondered about the impact of a proposed office complex on city-owned property where the Cod is docked, ever since the Geis Cos. of Streetsboro announced those development plans earlier this month.

Farace said the Cod's current location draws many of its 25,000 annual visitors from people who park at Burke Lakefront Airport and spot the sub while walking to the nearby Rock and Roll Hall of Fame and Museum.

He and other Cod representatives met Wednesday with Ward 3 Councilman Joe Cimperman and Chris Warren, chief of regional development for Mayor Frank Jackson.

Farace said he was assured by Cimperman and Warren that the Cod is an integral part of the lakefront.

"The Cod is a very important treasure," Warren said after the meeting. "We are committed to a continued presence of the Cod on the lakefront, and we will work with the Cod toward that goal."

But Farace noted he was asked to be open to the possibility of moving the memorial elsewhere on the lakefront.

Geis officials were not at the meeting and have not returned calls over several days for comment.

Farace said the Cod pays the city $375 a year to rent a 25-car parking lot along the 312-foot dock where the Cod is berthed. The site also includes a small grassy area for exhibits and maintenance facilities, and where commemorations, weddings, funerals and holiday events are held.

The Cod, which sank 15 Japanese ships during World War II, came to Cleveland in 1959 as a Navy Reserve training vessel. When the Navy decommissioned the sub in 1972 and announced plans to scrap it, a local "Save the Cod" campaign was launched and the memorial created in 1976.

Farace said the Cod Memorial has been designated as a National Historic Landmark.

Farace said he was not aware of the proposed office development until he read about it in The Plain Dealer.

"Every time a lakefront master plan is introduced, nobody comes to us and asks, 'How does your operation work?' " Farace said. "Nobody understands how the Cod works, except for us."

After the meeting, Farace said he was cautiously optimistic regarding the future of the Cod.

"They told me that any place you go, or if you stay, you'll get the things you require to maintain and preserve the Cod," Farace said.

"When they say they like the Cod, and they want it to remain a vital part of the lakefront, what more can we ask for?"

Contract Law Gives U.S. Government Options For Automatic Cuts: Report

Reuters, Aug. 29

WASHINGTON — A little-known aspect of U.S. contract law may provide a road map for how the Obama administration can implement billions of dollars of automatic budget cuts due to take effect in January without having to pay massive change fees to its contractors.

U.S. courts have found that the government has certain contractual rights because of its sovereign standing, including the right to unilaterally change the terms of its contracts, delay or stop work on contracts or terminate them outright, a congressional report found.

Companies would be entitled to some compensation for contract changes in some cases, according to a report by the nonpartisan Congressional Research Service that was issued in April but has not been made public until now.

In other cases, "the government could potentially avoid liability for actions that delayed or increased the costs of the contractor's performance because it acted in its sovereign capacity," said the report, which was completed in April but has not been widely publicized or circulated.

The report could be bad news for U.S. weapons manufacturers and others, who have warned that the U.S. government could face billions of dollars in change fees if it is forced to renegotiate thousands of contracts as a result of $1.2 trillion in automatic budget cuts that are due to take effect on January 2 under a process known as sequestration.

Top defense industry executives have met repeatedly with Defense Secretary Leon Panetta and White House officials to get details on how the Obama administration plans to implement the additional budget cuts, which became mandatory after lawmakers failed last year to agree on other deficit-cutting plans.

They say the uncertainty is depressing their ability to invest, hire new workers or look at possible new acquisitions.

Government officials usually prefer bilateral contract modifications, but federal contract law also gives the government the flexibility to reduce order quantities in the event of funding gaps or budget cuts, according to the report.

"The government has broad contractual and inherent rights that give it some flexibility in responding to funding gaps, funding shortfalls, and budget cuts," the report said.

It said the government could avoid change fees in certain contracts, including certain indefinite-quantity deals that set a minimum quantity of goods or services to be bought from the contractor, but do not spell out the total buy in advance.

The report said other contracts give the government the express or implied right to change the quantity of goods or services to be purchased, to delay or accelerate performance of a contract, or to scrap the contract outright — all without incurring liability for breaching the contract.

It said a 25 percent cut in one service contract was deemed to be within the general scope of the contract, but cuts of 50 percent and 73 percent to other procurement programs were later found to be beyond the scope of the changes clause.

"While there is no "bright-line test" for determining when a change is within the scope of the contract, the greater the magnitude of the change, in comparison to the total work called for, the more likely it is that the change will be found to be beyond the scope of the contract," the report found.

If the reductions were found to be within the scope of the contract, any downward adjustments could make the government eligible for downward price adjustments,

One congressional source familiar with the report said the defense spending reductions being discussed now were estimated to be around 10 percent each year, well below the 25 percent cut level that had already been deemed allowable.

The sophistication of the products involved was also a factor, the report noted in a footnote, citing a court case brought by General Dynamics Corp against the government in which the court found that changes that increased the price by 165 percent and extended the contract by three years were to be "expected in a contract for nuclear submarines."

The report did note that government contracts were subject to interpretation by various courts and boards of contract appeals, which have had differing opinions on recovery of costs.

It said individual contracts could also contain specific terms that were contrary to the general rules of contract law, and which would generally prevail over more standard terms.

China's Real Blue Water Navy

China is building a two-layered navy with a high-end Near Seas component and a limited, low-end capability beyond. It is not poised to speed across the Pacific to threaten America.

The Diplomat, Aug. 30

China's navy is not poised to speed across the Pacific to threaten America the way the Soviet Union once did, if not worse. This despite Peter Navarro and Greg Autry's over-the-top polemic,Death by China: Confronting the Dragon—A Global Call to Action, in which they claim that "[T]he People's Republic is moving forward at Manhattan Project speed to develop a blue water navy capable of challenging the U.S. Navy."

Such statements lack basis in fact and present an ideal strategic teaching moment to remind analysts and policymakers that Beijing's evolving naval structure and operations yet again show that China is not working off a traditional European, Soviet, or American naval development playbook. Even its most nationalistic and ambitious strategists and decision-makers do not seek what they would term a "global Far Oceans blue-water type" navy any time soon. Yet it is also misleading to argue, as one scholar recently did in The National Interest, that "All but the most hawkish hawks agree that the Chinese military will not pose a threat to the United States for decades." This is off the mark from the other direction—albeit in a considerably more subtle and thoughtful way. As a rare People's Liberation Army (PLA) delegation visited Washington recently for a series of official meetings,

it is important to understand where China's military is headed and why—particularly at sea, where U.S. and Chinese military platforms encounter each other most frequently.

Here is the critical point that both writings miss entirely—China's military, and navy, are not high-end or low-end across the board. Rather, in addition to domestic security/homeland defense, they have two major layers:

1. China has already developed, and continues to develop rapidly, potent high-end navy and "anti-Navy" capabilities. Like their other military counterparts, they are focused almost entirely on contested areas close to home.

2. It is also developing low-end capabilities. They are relevant primarily for low-intensity peacetime missions in areas further afield.

These two very different dynamics should not be conflated.

The second area has attracted headlines recently. China is in the process of developing a limited out-of-area operational capability to extend political influence and protect vital economic interests and PRC citizens working abroad in volatile parts of Africa and other regions. In essence, China seeks the bonus of being able to show the flag outside East Asia without the onus of assuming the cost and political liabilities of building a truly global high-end naval capability.

But while selected PLA Navy (PLAN) vessels make history by calling on ports in the Black Sea and Mediterranean to include first-ever visits to Israel and Bulgaria, the majority (like the rest of China's armed forces) are focused on areas closer to home—primarily still-contested territorial and maritime claims in the Yellow, East China, and South China Seas. From a Sino-centric perspective, these are, logically, the "Three Seas," or "Near Seas."

It is here, and largely only here—at least in a direct sense—that U.S. and Chinese military maritime approaches conflict. As an established superpower that has played a critical role in establishing the post-War world order, Washington seeks to work with allies, friends, and potential partners to maintain a single global trade system by preserving unfettered access to a secure commons for all, and to prevent the threat or use of force from being used to resolve political or territorial disputes. As a great power that feels wronged by recent history, Beijing seeks space to rise again and reassert control of previous claims by carving out a Near Seas zone of exceptionalism in which established global maritime norms do not apply.

Given Beijing's substantial focus on issues unlikely to be resolved anytime soon, it is hardly surprising that there are no reliable indications at this time that China desires a truly-global blue water navy akin to that of the U.S. today, or which the Soviet Union maintained for some time, albeit at the eventual cost of strategic overextension. China does seeks to develop a "blue water" navy in the years to come—but one that is more "regional" than "global" in nature. Chinese strategists term this a "regional [blue-water] defensive and offensive-type" navy.

China has three key interests in the maritime domain. The first concerns the Near Seas (primarily the East and South China Seas) and their immediate approaches in the Western Pacific, where China vies for regional influence with maritime neighbors such as Japan, Vietnam, and the Philippines, as well as the U.S. Fault lines are hardening in regional maritime disputes, as shown by the July 2010 ASEAN Regional Forum, where the bloc betrayed a deepening schism between the countries such as Cambodia, which are largely continental in their strategic orientation, and/or share land borders with China; and those such as the Philippines which share disputed maritime claims with Beijing but enjoy the buffers of water and alliance with the Washington.

Second, China's natural resource supply chain has become truly global, and in areas such as the Indian Ocean region Beijing faces threats from pirates and non-state actors. Key areas of interest are the deep-water passages through Southeast Asia—especially the Malacca, Sunda, and Lombok straits—and the key shipping lanes of the Indian Ocean emanating from the Persian Gulf, Red Sea, and Eastern Africa. The PLAN's ongoing anti-piracy mission in the Gulf of Aden is the centerpiece example of a limited out-of-area naval operation in pursuit of China's national interests.

Third, a growing number of Chinese citizens are working abroad in volatile areas, where a growing constellation of Chinese-owned economic assets have been invested. As the PLAN becomes more capable, there is growing nationalist pressure for Beijing to show the flag in support of PRC expats under threat from civil strife and other dangers. The result is that in future crises, the PLAN is likely to respond as it did in February 2011 when the missile frigate Xuzhou was dispatched to the Mediterranean to signal that Chinese citizens trapped in Libya could not be harmed with impunity.

Based on these potential contingencies, we believe Beijing is building a navy to handle a high-intensity conflict close to home where it can be supported by its large fleet of conventionally-powered submarines and shore-based missiles and aircraft. Vessels such as China's soon-to-be-commissioned aircraft carrierand Type 071 amphibious assault ships could be helpful in certain limited conflict scenarios against far-less-capable opponents—particularly in the South China Sea. Yet these large but limited capital ships' most likely use will be for handling missions geared toward:

1. The regional mission of showing the flag in disputed areas and attempting to deter potential adversaries;

2. Handling non-traditional security missions both in the East Asian/Western Pacific and Indian Ocean regions such as suppression of piracy, protecting/evacuating Chinese citizens trapped abroad by violence, and disaster response; as well as

3. Making diplomatically-oriented cruises such as the recent visits to Black Sea ports, which are aimed at showing the flag and showing foreign and domestic audiences that China is becoming a truly global power.

By contrast, there is currently little evidence that China is building a blue water capability to confront a modern navy like the U.S beyond the PLAN's East/Southeast Asian home-region waters. Beijing is accruing a limited expeditionary capability, but is not

preparing to go head-to-head with U.S. carrier battle groups outside of East Asia and the Western Pacific. There are a number of key indicators of Chinese progress toward building a strong regional navy with limited global operational capabilities, including:

1. Global Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) and satellite positioning, navigation, and timing (PNT). These are the sinews that knit modern military operations together. C4ISR facilitates both communication among one's own forces and detection and targeting of enemy forces. PNT facilitates placement of platforms and guidance of weapons. With the rapid development and launching of new satellites in its Beidou/Compass system, China will achieve Asia-Pacific coverage by the end of 2012 with an initial five-satellite Beidou-I constellation. It appears poised to meet is goal of global coverage by 2020; 13 Beidou-II satellites have been launched to date, with 11 already operational of the 35 needed for full coverage. This is a necessary but not sufficient metric: PNT and C4ISR can help to support a wide range of military operations, and will not in themselves confer blue water presence.

2. Anti-submarine warfare (ASW). Detection and targeting of enemy underwater systems is facilitated by increasing numbers and quietness of long-range nuclear-powered submarines (SSN). Key indicators include construction of SSNs and additional deployment of these and other surface aerial platforms with significant demonstrated ASW capabilities; as well as acquisition of maritime patrol aircraft and operation from nearby carriers or land bases and defended by surface-to-air missiles (SAMs), etc. to protect these assets. This is an under-appreciated but vital metric. For instance, conventionally-powered submarines—even with the air-independent power (AIP) that China's Yuan-class likely possesses—simply lack the speed and stamina to be effective long-range power projection platforms. To date, while it is conducting extensive research on acoustics and related areas, China has made little progress in ASW, and appears to avoid competing here for fear of wasting resources on immature and inadequate approaches. Its existing nuclear-powered submarines remain relatively noisy, though follow-on variants may be less so.

3. Area air defense. Additional advanced surface vessels with long-range area air defense systems and aircraft to support radar can extend the protective envelope surrounding naval task forces. Already equipping its most advanced surface vessels with relevant missiles, China might compensate for lack of proximity to land-based missiles forces on extended missions with increased Soviet-style adoption of long-range anti-ship cruise missiles in surface vessels. Introduction of improved hardware variants and increasing practice of their utilization is critical to increasing capability.

4. Long-range airpower. Increased airpower projection requires development/procurement of strike and long-range transport aircraft to operate off carriers/land bases overseas, aerial refueling capabilities, and related doctrine and training programs. Possible airframes include long-range stealthy bombers and helicopters—areas of particular Chinese weakness today.

5. Production of military ships and aircraft. In addition to heightened production at existing facilities, accruing meaningful numbers of long-range vessels and airframes would likely require China to establish new, modern shipyards dedicated to military ship production or expand military-dedicated areas in co-production shipyards; as well as to improve facilities/practices for manufacturing aircraft and aeroengines. Aeroengines remain one of the Chinese defense industry's Achilles' heels, and are extremely difficult to master, but represent an area that the world's three top-tier firms (General Electric, Pratt & Whitney, and Rolls Royce) are unlikely to supply the PLA.

6. At-sea replenishment. A strong contingent of replenishment ships is vital for supporting expeditionary operations, but the PLAN currently has only three long-range replenishment vessels, according to Jane's. By contrast, the U.S. Navy has a fleet of 32 long-range combat replenishment vessels and other support ships. Given underway replenishment vessels' relative similarity to commercial ships and China's large commercial shipbuilding capacity, Beijing is fully capable of surging production of these at any time. As such, its replenishment vessel construction rate will be a particularly revealing barometer of the PLAN's future expeditionary intentions.

7. Remote repair. Ability to conduct sophisticated repairs on ships and aircraft, either through tenders or overseas facilities, is critical to sustaining them far from home. China has not established significant capabilities in these areas, however, and will have to make a major effort to do so.

8. Operational readiness. Manifold efforts are required for China to satisfy this criterion: more complex, joint exercises; coordinated multi-axis anti-ship/carrier operations; steady deployment to vulnerable sea lanes to increase presence, familiarity, and readiness; and more long-range training missions. China is moving gradually in this direction, but still has a long way to go.

9. Overall capacity. Development here hinges on complex and difficult development of "software," which is typically even harder to develop than "hardware." Maturation of advanced levels of increasingly joint PLA doctrine, training (e.g., more all-weather, over-water, attack training for pilots), and human capital will be needed.

10. Overseas facilities. As relates to several of the metrics outlined above, true blue water capabilities likely require acquisition of "places," if not full-fledged "bases," e.g., in the Indian Ocean. Beijing has merely tiptoed in this area, however, primarily out of political principle and caution. It remains to be seen to what extent it will be willing to cultivate the alliances and bear the economic and political costs, as well as the security vulnerabilities, that such an extraterritorial infrastructure entails.

Reaching these various benchmarks will require strategic focus, resources, effort, and time. Beijing is approaching some milestones already, but may well not reach others at all for the foreseeable future. The vast majority of these instructive indicators will be readily visible to observers around the world—not just in government circles, but outside as well. That leaves major opportunities for analysis and understanding—and few excuses for conflation of the underlying factors at play.

The PLAN is acquiring the hardware it needs to prosecute a major regional naval showdown. Simultaneously, an increasingly-capable, but still limited number, of vessels can fight pirates, rescue Chinese citizens trapped by violence abroad, and make "show-the-flag" visits around the world. But the PLAN is not set up to confront the U.S. at sea more than 1,000 miles from China. Even if the PLAN surged production of key vessels such as replenishment ships, the resources and steps needed to build a globally-operational navy leave Beijing well over a decade away from achieving such capability in hardware terms alone. Building the more complex human software and operational experience needed to become capable of conducting large-scale, high-end out-of-area deployments could require at least another decade. Meanwhile, however, China's challenges at home and on its contested periphery remain so pressing as to preclude such focus for the foreseeable future.

The bottom line is that China's present naval shipbuilding program aims to replace aging vessels and modernize the fleet, not to scale-up a modern fleet to the size and composition necessary to support and sustain high-end blue water power projection. China is building a two-layered navy with a high-end Near Seas component and a limited, low-end capability beyond, not the monolithic force that some assume.

US Military Scientists are Working on Unmanned Long-Endurance Submarine

By Kalwinder Kaur, azorobotics.com, Aug 24, 2012

US military scientists are developing an unmanned submarine that can hang around underwater for several months to track the presence of enemy submarines.

DARPA, the US Defense Advanced Research and Projects Agency, awarded a contract to the Science Applications International Corporation (SAIC) to develop the design, which is meant for the products of the ASW (Anti-Submarine Warfare) ACTUV (Continuous Trail Unmanned Vessel) program to offset the diesel-electric submarines, which are a potential risk to the US Navy and its global allies.

SAIC is engaged in Phases 2, 3 and 4 of the ACTUV submarine program to design, develop, and conduct sea trials of an unmanned vessel that is capable of tracking diesel electric submarines, covering thousands of kilometers of sea with reduced man power. Particularly, Phase 2 is the 'Design a vessel' stage and Phase 3 is the 'Build a vessel' stage, while Phase 3 is the 'Test a vessel' stage. Phase 1, which dealt with the refinement and validation of the system concept, is already completed.

If successful, the ACTUV submarine program will deliver a superior technology to the US Navy and reduce the navy's manpower expenses in addition to other benefits. Operational unmanned submarine sea trials are slated to commence between the second quarter and third quarter of 2015.

DARPA's ACTUV program manager, Scott Littlefield stated that the vessel will feature robust autonomy ensuring safe operations according to maritime laws, advanced software, and advanced sensors to constantly track enemy submarines. In addition, the program creates foundational technologies for upcoming unmanned naval systems.