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# *The Silent Sentinel*

***MAY 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.

## *If You Receive "The Silent Sentinel" By **Regular Mail,***
## PLEASE READ THIS

Over the next two months, "The Silent Sentinel" will be attempting to minimize the number of Sentinels sent via the United States Postal System. Our goal is to become as paperless as possible. Consequently, we would like to hear from you ASAP. You may write to Mike Hyman, Editor (physical address and email are on page two) in order to pass on your email address for Sentinel delivery. ***If you are receiving the Sentinel via the Post Office and do not own a computer, don't worry; we will not drop you!*** However, if you are able to receive the Sentinel electronically, please seriously consider switching. Printing costs and postage are increasing--delivery via email can save the Base a substantial amount of money.

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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.***

**NAME:** _____

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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*

## *May 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 8 May, 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**
Bob Bissonnette
Anne Marie Gorence
Al Strunk

# *Submarine Losses in April*

Originally Compiled by C J Glassford

S – 49 (SS 160) - Duty Section on Board :
Battery Explosion, on 20 Apr 1926, at Submarine Base, New London, Connecticut : " 4 MEN LOST "

PICKEREL (SS 177) - 74 Men on Board :
Sunk, on 3 Apr 1943, by Japanese Minelayer and Auxiliary Sub Chaser, Off Northern Honshu, Japan :
" ALL HANDS LOST "

GRENADIER (SS 210) - 80 Men on Board :
Scuttled, on 22 Apr 1943, after Japanese Seaplane Attacks Damaged the Boat the previous day, off Penang, Malasia :
" 4 MEN LOST - 76 MEN SURVIVED POW CAMP "

GUDGEON (SS 211) - 78 Men on Board :
Probably Sunk, on 18 Apr 1944, By Japanese Naval Aircraft, Southwest of Iwo Jima :
" ALL HANDS LOST "

SNOOK (SS 279) - 84 Men on Board:
Probably Sunk, on 9 April 1945, by a combination of Japanese Naval Aircraft, Escort Vessel, Coast Defense Vessels, and/or Japanese Submarine, In the Nansei Soto Area:
" ALL HANDS LOST "

THRESHER (SSN 593) - 129 Men on Board:
Sunk,on10 April1 963,after a possible Pipeing Failure during
Deep Submergence Tests, Off the New England Coast
" ALL HANDS LOST "

BONEFISH (SS 582) - 77 Men on Board:
Battery Fire and Explosion. on 24 April 1988, While operating off the Florida Coast : " 3 MEN LOST "

## *Apologies*

I really have to apologize for not including the *Commander's Column* in this issue as well as some photos from the *La Mesa Parade* and the *Submarine Ball.* Bob Bissonnette definitely did send them to me--and I saw them sitting happily in my Email Inbox just yesterday. Still, when I went to find them this morning, they were no longer on my machine. Frankly, I am placing the loss on the U.S. Secret Service, Wall Street Bankers, Walmart, the American military establishment, and George Bush--in addition to a weak economy, elevated unemployment levels, the global oil market, Israel/Palestinian relations, and the trade imbalance with the Peoples Republic of China. *Mike Hyman, Editor*

## Minutes for Submarine Veterans San Diego, 10 April 2012.

1900 – Meeting of the Submarine Veterans Inc., San Diego Base was called to order by Base Commander BoB Bassonette, but before the official opening it was requested by the Base Commander that a moment of silence be observed for USS Thresher lost 49 years ago today.

**Conducted opening exercises:**
Reading of Our Creed:
Pledge of Allegiance:
Chaplin Lead in Prayer:
Conducted Tolling of the Boats:
Observed a moment of Silent Prayer:
Junior Vice Commander recognized past E-Board members, Past Officers and guest present.

Secretary presented the sailing list – 35 members and one guest present.
Treasurer's report was presented to the membership. A Tax report will be submitted to the National and a copy of the tax report will be posted online.

**Call for Committee Reports:**
Chaplain Binnacle List: Al Strunk, Maryann Coates(Ron's wife) Phill Richeson spent sometime in the hospital but is here tonight. Mike Coad passed away April 1.

Parade Committee: Jack Kane:

**Saturday April 21st: Linda Vista Multicultural Parade**
Muster at 1000 – Parade at 1100
**Saturday May 19th: Ramona Main Street Parade**
Muster at 0900 – Parade at 1000
**Saturday June 2nd: La Mesa Salute to Old Glory and 100th Anniversary Parade**
Muster at 0900 – Parade at 1000
**Wednesday July 4th: Julian Independence Day Parade**
Muster at 1030 – Parade at 1200
**Monday November 12th: San Diego Veterans Day Parade**
Times TBD – Grand Marshal LtGen Chuck Yeager
The Santee parade scheduled for May 26 is in question because the Santee Parade committee is requiring us to have 500 dollar liability bond.

Membership Committee: 314 active members, 87 Holland members, one new member: Steve Jennings, Chief of the Boat on USS JEFFERSON CITY. Welcome aboard. Ray requested if you want to contact him please us his email.

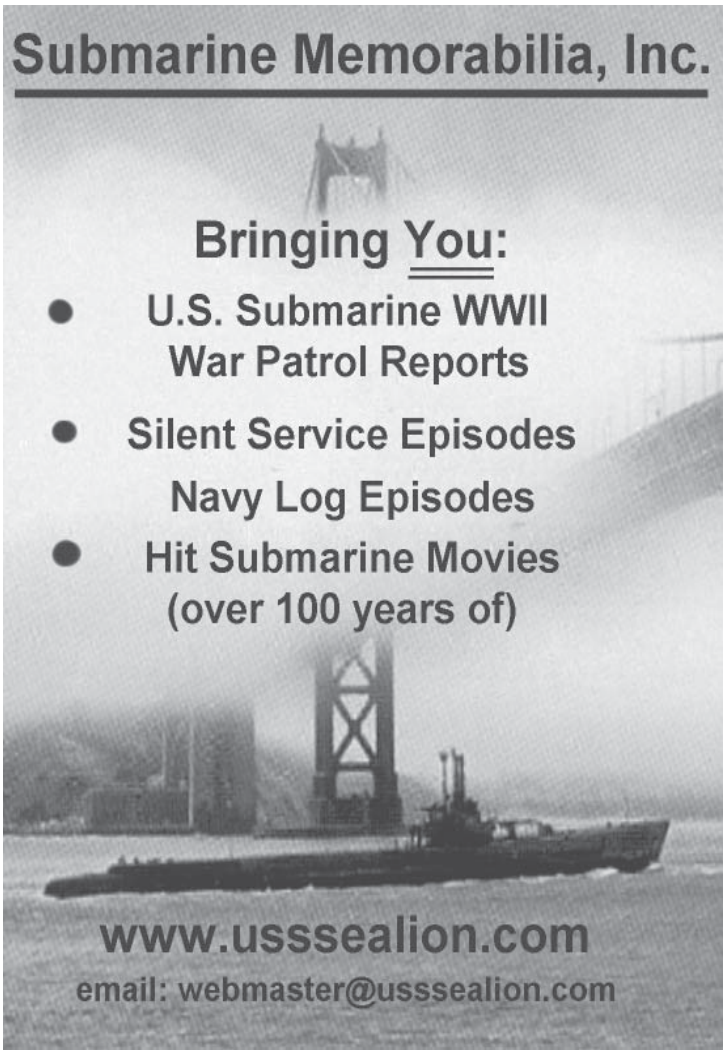
Scholarship Committee: Dead line for applications is April 15 so get your candidates submitted. More information is posted on the website. If we do not receive any candidates by the 15th we might extend the dead line additional month.

Storekeeper: We have some items here and patches can be ordered. Let me know if you would like to order anything special.

Breakfast Committee: Next Sub vet breakfast will be April 29th from 0800 to 1200, and if you would like to help please be here at 0730. Breakfast is still 6 dollars. Phill has donated the hotdogs tonight and all money will be donated to the organization, Thanks Phill.

1930 – Base Commander Called for a Break….
1940 – Base Commander called meeting to order.

**Unfinished Business**
The Timers Luncheon will be held at 1030, 20 April. It will be at the Harbor Inn on the back patio. There will be a Tolling of the Boats Ceremony followed by a luncheon. The cost of the Luncheon is 20 dollars. If




you still want to attend you need to call Command Master Chief Brian Mcdonough @ 619 553-7161. Monies will also be accepted at the door.
Tickets for the Submarine Ball can be obtained from Master Chief Metcalf.
USSVI National Convention will be held 2-9 September at Norfolk, Virginia. Bob has been asked to take photos at the convention.

**New Business**

Repairs to the float are needed and we would like a team to help repair the skin of the float. The under frame is good but the outer side needs to be replaced, and painted. Dave Ball has volunteered his house and will provide a BBQ after the repairs are completed. The base will supply all the material. Dave address is: 3804 Wildwood Road., San Diego, CA. phone: 619 733 3804.

Memorial Day service at the Submarine Base will be on 28 May at 1000. The Scamp base ladies will again provide refreshment.

**Good of the Order**

There is some Submarine history information and some magazines you might find interesting they are located on the back table.

American Legion Post 434 held a Tribute to US Submarine Force on 7 April from 1400 to 1800. The commander there would like to start a sister base in Chula Vista for the outreach to Sub vets in the south bay area. This is a great idea and our Base will support their efforts.

The George C. Marshall SSBN 654 first ships reunion will be held this August 8-11, 2012 at Groton, Connecticut. There are flyers in the back.

Fred related the story of the loss of two shipmates when the USS Barbel began to dive while on the surface. Fred was the Chief of the Boat and was directly involved. It is a sober reminder who dangerous our profession can be. He wanted to remind us that this event happened on 1 April and to remember his shipmates.

Mike Hyman discussed 10 percent discounts at Home Depot and other stores which give discounts to veterans and active duty military.

2000 – Meeting adjourned.

## Sailing List for 10 April 2012

| | | |
|---|---|---|
| JIM BILKA | BOB BISSONNETTE | ED FARLEY |
| FRED FOMBY | RAY FERBRACHE | JOEL EIKAM |
| JACK LESTER | JACK KANE | LARRY DORE |
| DAVID BALL | BOB COATES | M. BURCIAGA |
| CHARLIE MARIN | BOB OBERTING | D. MORTENSEN |
| BOB FARRELL | MERT WELTZIEN | ED WELCH |
| RUSS MOHELAVO | FRANK MCCOY | BOB CHAPMAN |
| J. GRIENENBERGER | BENNY WILLIAMS | PHILL RICHESON |
| SERGIO FROST | MIKE COSGROVE | CHARLIE TATE |
| RON GORENCE | LARRY KENDALL | D. MCCREIGHT |
| DAVID WOODWARD | CLIFF BRITT | MIKE HYMAN |
| BILL EARL | PHILLIP RICHESON | WARREN BRANGES |

**Panel to Navy: Keep 12 ballistic missile subs**
*Navy Times, April 25*

A minimum of 12 ballistic missile submarines must remain in service for the foreseeable future, a key congressional committee said, despite Navy plans to drop below that number beginning in 2029.

The provision is included in the markup of the House Armed Services seapower and projection forces subcommittee, which was released Wednesday.

Although 14 Ohio-class "boomers" are now in service, the fleet is scheduled to begin shrinking in 2027 as the oldest units are retired. Current Navy plans show the force dropping to 11 ships in 2029 and reaching 10 ships in 2032, where the level holds for a decade before starting to rise again as new replacement submarine come on line.

The markup — the first legislative process in assembling a defense authorization bill to send to the full House of Representatives — also approves a Navy request for a new multiyear procurement authority for Virginia SSN 774-class attack submarines. The subcommittee granted MYP authority for 10 submarines beginning in 2014, and allows for incremental funding of the ships.

Other Navy-related provisions in the markup include:

• Authorization of an MYP for up to 10 Arleigh Burke DDG 51-class destroyers and allowance of $3 billion for two ships in the 2013 program, the first year of the MYP.

• Granting an extension of the incremental funding of the future aircraft carriers CVN 79 and CVN 80 from a five-year period to a six-year period.

• Limiting spending on the refueling and complex overhaul of the aircraft carrier Abraham Lincoln to $1.6 billion in 2013, the first year of a two-year incremental funding profile.

The markup also requires additional risk-reduction technology development for the follow-on aircraft of the Unmanned Carrier-launched Surveillance and Strike system — currently in technology development as the X-47B aircraft — and requires a "competitive acquisition environment" for the program. The markup notes the change in terminology from a "future unmanned carrier-based strike system" to "unmanned carrier-launched surveillance and strike system," indicating an increased emphasis on the surveillance role.

It also repeals a provision in the 2008 defense authorization law that required all new classes of combatant strike vessels to be nuclear-powered, a pet project of former Seapower subcommittee chairman Rep. Gene Taylor, D-Miss., who was defeated in the last elections.

The markup also directs the Navy to report on the issue of ship superstructure cracking, with an emphasis on the choice of superstructure material for the DDG 51 Flight III-class ships, the first of which is scheduled to be ordered in 2016. The subcommittee wants information "comparing the estimated construction costs for a deckhouse made of each of the three materials, or even a possible hybrid of two or all three, and then compares the estimated lifecycle costs for the designed life of the ship."

The markup makes no mention for producing any other information other than cost factors.

The full committee will hold its formal markup sessions on Thursday.

**The War Spreads To The Caribbean**
*Strategy Page, April 25, 2012*

On March 30th, the U.S. Coast Guard captured its 30th cocaine smuggling submarine, in the Caribbean. This is the fifth such capture in the Caribbean, with the other 25 captured in the Pacific. It's currently estimated that 80 percent of the cocaine smuggled into the United States leaves South America via these submarines or semi-submersible boats. Most of these craft are

"semi-submersibles". They are 10-20 meter (31-62 foot) fiberglass boats, powered by a diesel engine, with a very low freeboard, and a small "conning tower", providing the crew (of 4-5), and engine, with fresh air, and permitting the crew to navigate. A boat of this type was, since they first appeared in the early 1990s, thought to be the only practical kind of submarine for drug smuggling. But in the last decade the drug gangs have developed real submarines, capable of carrying five tons of cocaine that cost a lot more, and don't require a highly trained crew. These subs borrow a lot of technology and ideas from the growing number of recreational submarines being built.

The Colombian security forces and other Latin American navies have been responsible for most of these vessel captures. Most of these boats are sunk by their crews when spotted, but the few that were captured intact revealed features like an extensive collection of communications gear, indicating an effort to avoid capture by monitoring many police and military frequencies. The Colombians have captured several of these vessels before they could be launched. In the last few years, the Colombians have been collecting a lot of information on those who actually build these subs for the drug gangs and FARC (leftist rebels that provide security, and often transportation for moving cocaine.) That includes finding out where the construction takes place.

Last year Colombian police arrested eighteen members of a gang that specialized in building submarines and semisubmersible boats. As police suspected, some (five) of those arrested were retired or on active duty with the Colombian Navy (which operates two 1970s era German built Type 209 submarines). These arrests were part of an intense effort to find the people responsible for building subs for cocaine gangs. Find the builders, and you stop the building efforts.

Since cocaine cartels in South America began using submarines and semi-submersible craft to transport cocaine north, the U.S. and Colombia have been desperately seeking the specialists responsible for designing and building these craft. Last year Argentina revealed they had arrested one of the main organizers of the sub building operation. The suspect, Ignacio Alvarez Meyendorff, was identified as working for the Colombian Norte del Valle drug cartel, and in charge of logistics for the submarine construction project. It's believed that Meyendorff was tracked down via information obtained by the U.S. Office of Naval Intelligence (ONI). Apparently, Meyendorff, or documents captured when he was arrested, provided enough data to make further arrests, and run down the location of many of the subs.

The submarines that have been captured have, on closer examination turned out to be more sophisticated than first thought. The outer hulls are made of strong, lightweight, Kevlar/carbon fiber that is sturdy enough to keep the sub intact, but very difficult to detect with most sensors. The hulls cannot survive deep dives but these boats don't have to go deep to get the job done. The diesel-electric power supply, diving and surfacing system and navigational systems of captured subs was often in working order. It was believed that some of those who built these boats probably had experience building recreational subs. The sub builders also had impressive knowledge of the latest materials used to build exotic boats. It had already become clear that something extraordinary was happening in these improvised jungle shipyards.

It was only two years ago that Ecuadoran police found the first real diesel-electric cocaine carrying submarine. It was nearly completed, and ready to go into a nearby river, near the Colombian border, and move out into the Pacific Ocean. The 23.5 meter (73 foot) long, three meter (nine feet) in diameter boat was capable of submerging. The locally built boat had a periscope, conning tower and was air conditioned. It had commercial fish sonar mounted up front, so that it could navigate safely while underwater. There was a toilet on board, but no galley (kitchen) or bunks. Submarine experts believed that a five man crew could work shifts to take care of navigation and steering the boat. The boat could submerge to about 16 meters (50 feet). At that depth, the batteries and oxygen on board allowed the sub to travel up 38 kilometers in one hour, or at a speed of 9 kilometers an hour for 5-6 hours. This would be sufficient to escape any coastal patrol boats that spotted the sub while it moved along on the surface (its normal travel mode.) The boat could also submerge to avoid very bad weather. The sub carried sufficient diesel fuel to make a trip from Ecuador to Mexico. There was a cargo space that could hold up to seven tons of cocaine.

The sub was captured where it was being assembled, and a nearby camp for the builders, appeared to house about fifty people. A lot of evidence was collected, and apparently the U.S. DEA (Drug Enforcement Agency) used that to develop clues about who was involved. It was the DEA that put together the pieces that led to identifying Meyendorff and locating him in Argentina.



The Ecuadoran boat was the first such sub to be completed, but not the first to be attempted. A decade ago, Russian naval architects and engineers were discovered among those designing and building a similar, but larger, boat. However, that effort did not last, as the Russian designs were too complex and expensive. It was found easier to build semi-submersible craft. But more and more of these new type subs are being found.

**Russia, China Complete First Stage of Naval Drills**
*Bahrain News Agency, Apr 25, 2012*

Moscow, April 25 (BNA) - Russia and China have completed the first stage of naval exercises in the Yellow Sea, off the coast of Qingdao in eastern China, the Russian Navy said.


Though Russia and China conduct joint naval drills on a regular basis since 2005, the Maritime Cooperation-2012 will be the first Chinese-Russian military exercise outside the framework of the Shanghai Cooperation Organization, according to Russian's News Agency (RIA Novosti). "The first stage of the exercise, the deployment of ships - has been completed," the ministry said. The exercise, to last until Friday, involves more than 20 vessels from Russia and China, including destroyers, escort vessels, hospital ships, submarines and supply ships. "A task force of Russian ships, comprising the Varyag missile cruiser, the Admiral Vinogradov, the Marshal Shaposhnikov and the Admiral Tributs large anti-submarine destroyers and the SB-522, MB-37 and Pechenga supply ships, left the port of Qingdao and anchored in the area of the Maritime Cooperation-2012 exercises in the Yellow Sea," the Russian Navy said in a statement. On Wednesday the participants will begin the active phase of the exercise, comprising several simulated missions, such as the rescue of a hijacked ship, commercial vessel escort, and defending a convoy from air and sea attacks. Russian Defense Minister Anatoly Serdyukov said on Tuesday the exercise is not directed against "third states" and is not an attempt by Moscow and Beijing to create a military alliance.

**Iran Prepares Its Submarine Fleet For Blockade Of The Strait Of Hormuz**
*Articles.businessinsider.com, April 23*

We reported a couple weeks ago that Iran was demanding all U.S. ships entering the Strait of Hormuz stop and check in with the Revolutionary Guard. Now, they're saying that move has blockaded the Strait of Hormuz.

FARS News Agency, Tehran's state run media outlet, announced Tehran is continuing a full blockade on all ships entering the Strait, with each undergoing inspection.

From FARS:

"The alien vessels which enter the Persian Gulf via the Strait of Hormuz always provide the needed answers and information to the Islamic Revolution Guards Corps (IRGC) units," Lieutenant Commander of the IRGC Naval Force Alireza Tangsiri said on Wednesday.

He further noted the deployment of a US aircraft carrier in the region, and said, "This vessel, similar to the other warships, answered all the questions asked by the IRGC Navy without any problem or making any particular move and then continued the path to its specified destination."

The UPI reports that Iran's fleet of 20 submarines are much on the mind of U.S. military officials as Tehran increases it's bluster and stance in the Strait.

The submarines are seen as a danger to international tanker traffic, which ships one-fifth of the world's oil supplies through the narrow strait every day, and to Western warships if Iran carries out its threat to close Hormuz if its oil exports are blocked.

U.S. military planners must factor in the Iranian submarine threat as the Americans, spearheaded by the U.S. Navy 5th Fleet based in Bahrain, square off for possible conflict with Iran over its contentious nuclear program. "The Iranians would not have acquired so many submarines if they did not think they would come in handy," U.S. defense analyst Scott Charney observed in an April 9 assessment of Iranian submarine capabilities.

Tehran's submarine fleet is led by three Russian Kilo-class diesel electric boats, deep water subs halfway through their 30-year lifespan, and a large number of "midget" subs that can lurk in the shallow waters of the strait.

One 76-foot Nahang, which means whale in Farsi, is supposed to be completely stealth and able to evade detection. Finally, Iraq President Nuri al-Maliki is in Iran bolstering ties with its neighbor and ironing out trade agreements. Dina Al-Shibeeb at Al-Aribaya reports Iran's first vice president Mohammed Ridha Rihaimi said the two countries will "form a great international power," if they succeed in forming an alliance. From Al-Aribiya: He pointed out to the two countries' "special relations," and how both were facing "international conspiracies due to their beliefs and goals." He did not elaborate on what these beliefs or goals include. The two countries' trade agreements must be speedily fulfilled, he added. The agreements include railway projects connecting the two neighboring countries and cooperation between their oil and airline industries.

**Iran Building Power Submarine Force in Persian Gulf**
*english.farsnews.com, Apr 22, 2012*

TEHRAN (FNA)- Iran has been building up its submarine fleet with mainly indigenously built boats considered ideal to carry out Tehran's threat to close the Strait of Hormuz in case of military confrontation with the US and its western allies, a report said.

Iran has been building up its submarine fleet for the last decade, adding mainly indigenously built small boats armed with torpedoes and mines that make them ideal platforms to carry out Tehran's threat to close the Strait of Hormuz, the gateway to the Persian Gulf, if it comes under attack by the US or Israel or if export of its crude supplies are blocked by the US-led West.

Accurate data on the Islamic Republic's underwater fleet, the only one in the Persian Gulf region, are hard to come by but Western analysts estimate the Iranian navy and the more powerful naval arm of the Islamic Revolution Guards Corps (IRGC) operate around 20 submarines, a UPI report said.

Most of these have been built by the state-owned Defense Industries Organization, a conglomeration of defense companies controlled by the Defense Ministry that supervises all military production, research and development, it added.

The submarines are seen as a danger to international tanker traffic, which ships one-fifth of the world's oil supplies through the narrow strait every day, and to Western warships if Iran carries out its threat to close Hormuz if its oil exports are blocked.

According to UPI, US military planners say they factor in the Iranian submarine threat if the Americans, spearheaded by the US Navy 5th Fleet based in Bahrain, square off for possible conflict with Iran over its civilian nuclear program.

"The Iranians would not have acquired so many submarines if they did not think they would come in handy," US defense analyst Scott Charney observed in an April 9 assessment of Iranian submarine capabilities.

"Thanks to these undersea craft, the Tehran government may have developed the ability to dominate its neighbors and ward off attack from faraway powers even as most of the foreign policy community has been chasing the specter of nuclear weapons."

The report also mentioned that the Iranian sub fleet is led by three Russian-built Type 877EKM Kilo class, diesel-electric boats delivered in 1991-96 and capable of crippling US warships. But these subs are built for long-range, blue-water operations outside the Persian Gulf.

They operate primarily in the Arabian Sea and Indian Ocean, although in July 2011 at least one Kilo, possibly two, deployed to the Red Sea, a key shipping lane. It was believed to be the first such deployment, and suggested the Iranians were prepared to operate at greater range than they have so far.

The Kilos are based at Bandar Abbas, headquarters of the IRGC's naval wing but they also have pens at Jask, on the East of the Strait of Hormuz.

The bulk of the fleet consists of Iran's midget subs. There are at least 12 Ghadir class boats, named after Ghadir Khumm, a Shiite Muslim holy eve, and unveiled in 2007.

The last two of these 120-ton boats were handed over to the regular navy in February. Iranian officials say these 92-foot craft can fire torpedoes and anti-ship missiles and are specifically designed for the Persian Gulf's shallow waters.

The latest addition is a Nahang class vessel, the first of a new type of sub currently under construction at the main Bandar Abbas navy base on the Southern coasts of Iran.

The 76-foot, 350-400 ton Nahang - Farsi for "Whale" - is said to be able to evade detection by radar. An unknown number of vessels of this class are expected to be produced.

The next class planned is the diesel-electric Qaaem, the lead ship of which is under construction by the DIO at Bandar Abbas.

The Iranians announced the start of production in August 2008. Officials describe this as "semi-heavy" sub of 1,000-plus tons deadweight capable of launching torpedoes and missiles.

"The Iranians seem to be seeking to bridge the gap between the midget subs and the Kilos by constructing what they call 'semi-heavy' subs of the Qaaem and/or Fatah class, with more possibly to come," Charney observed.

"Such submarines, if successful could complement the Kilos at first and eventually supplant them when the larger submarines reach the end of their service lives …

"In the case of conflict with the United States, Iranian submarines could sink one or more American ships and/or submarines, resulting in unacceptable casualties for the United States. This strategy is behind most of Iran's recent military moves," Charney noted according to UPI.

Iran's naval power has even been acknowledged by foes. In a Sep. 11, 2008 report, the Washington Institute for the Near East Policy also said that in the two decades since the Iraqi imposed war on Iran, the Islamic Republic has excelled in naval capabilities and is able to wage unique asymmetric warfare against larger naval forces.

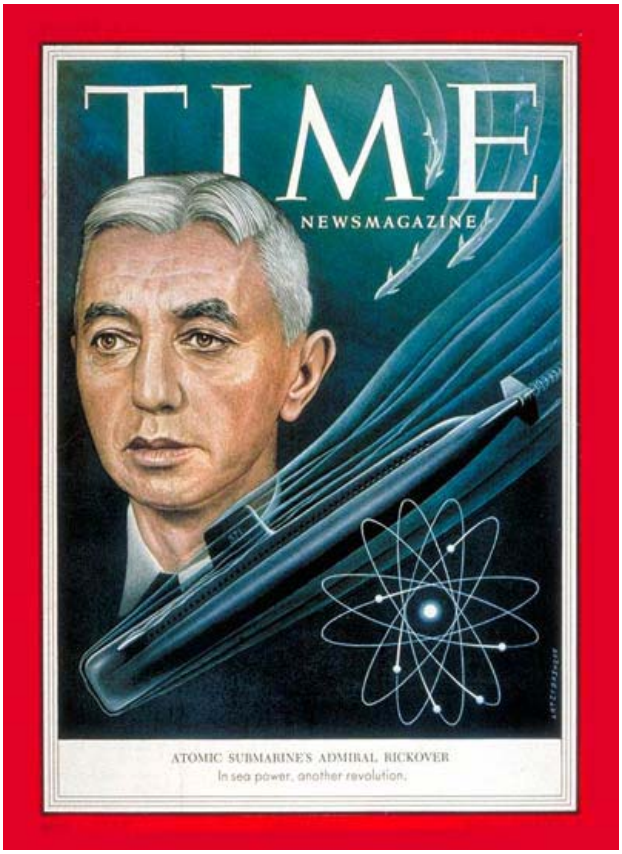
According to the report, Iran's Navy has been transformed into a highly motivated, well-equipped, and well-financed force and is effectively in control of the world's oil lifeline, the Strait of Hormuz.

The study says that if Washington takes military action against the Islamic Republic, the scale of Iran's response would likely be proportional to the scale of the damage inflicted on Iranian assets.

The Islamic Republic's top military officials have repeatedly warned that in case of an attack by either the US or Israel, the country would target 32 American bases in the Middle East and close the strategic Strait of Hormuz.

An estimated 40 percent of the world's oil supply passes through the waterway.

A recent study by a fellow at Harvard's Olin Institute for Strategic Studies, Caitlin Talmadge, warned that Iran could use mines as well as missiles to block the strait, and that "it could take many weeks, even months, to restore the full flow of commerce, and more time still for the oil markets to be convinced that stability had returned".




**Seawolf Gets A Secret Upgrade**
*The Strategy Page, Apr 21, 2012*

The American SSN (nuclear attack sub) USS Seawolf has returned to service after a 31 month, $280 million refurbishment. The Seawolf entered service in 1997, and SSNs typically undergo a major maintenance and upgrades after about 20 years. The Seawolf went in for this kind of work early, and the refurbishment was more extensive (and expensive) than usual for regular Depot Modernization Period work. This may have to do with the fact that the Seawolf was the first of its class. This might indicate the installation of some special equipment for intelligence missions. A sister ship, the USS Carter, was extensively outfitted as an intelligence and special operations submarine. The navy admitted what the Carter was rebuilt for but for even more sensitive missions you would want to withhold all details.

The twenty-nine 9,000 ton Seawolf-class SSNs were supposed to replace the Cold War era Los Angeles boats but Seawolf proved too expensive. Only three were built. The Seawolf was designed for the Cold War, carrying fifty weapons (torpedoes, cruise missiles, or Harpoon anti-ship missiles) for its eight 26-inch (660-millimeter) torpedo tubes. Seawolf was fast (top speed of over 60 kilometers an hour) and much quieter than the Los Angeles boats. To replace the un-built Seawolfs the 7,800 ton Virginia-class was designed. Think of it as a Los Angeles size hull with a lot of Seawolf technology installed. The Virginia-class boats ended up costing about half as much as the Seawolfs. But that was largely possible because the Virginias used a lot of the new technology developed for Seawolf.

The U.S. currently has three classes of SSN. Most are the 6,900 ton Los Angeles-class SSNs. Sixty-two of these submarines were built, and 43 are still in service. Armed with four 21-inch (533-millimeter) torpedo tubes, they carry twenty-six weapons for those tubes (either the Mk 48 torpedoes or BGM-109 Tomahawk cruise missiles). The last 31 Los Angeles-class SSNs added the Mk 45 vertical-launch system (VLS), which carries another twelve Tomahawks. If built today these late model Los Angeles class boats would cost about $1.5 billion each. There are eight Virginias in service and another 24 planned.

**Signal lantern from Confederate sub conserved**
*Associated Press, April 19*

**NORTH CHARLESTON, S.C. (AP) -** A small lantern thought to have been used to signal from the Confederate submarine Hunley has been conserved.

But it leaves more questions about what happened that night in 1864 when the Hunley sank the Housatonic off Charleston Harbor, becoming the first sub in history to sink an enemy warship.

Both Union and Confederate accounts mention a blue light seen when the Housatonic was attacked. But the lantern lens is clear and scientists say they don't think there ever was any sort of blue coating.

The mystery could be in naval terminology. Scientists say it seems at that time the term blue light referred to any sort of emergency light or flare - not simply light blue in color.

The Hunley sank before it could return from its mission.

**Defen[s]e faces 'catastrophic' lack of submarine capacity**
*Augusta-Margaret River Mail (Australia), April 19*

AUSTRALIA could be left without a single military submarine for crucial years during the Asia Pacific century, when naval tensions between global powers will be played out in Australia's backyard.

A paper by the Australian Strategic Policy Institute says the government risks a ''catastrophic'' gap in capability because it has delayed the decision to replace six Collins class submarines for so long.

The government announced three years ago that it planned to replace the Collins class vessels by 2030 with a dozen advanced submarines.

''The picture is not encouraging,'' write the institute's analysts Andrew Davies and Mark Thomson. ''If current plans are adhered to, a capability gap is inevitable some time in the late 2020s, and a period [in the early 2030s] of no submarine capability at all is possible.''

In 2009 the government published ‘’Force 2030'', a strategic document that outlined plans for reshaping the Defence Force to deal with the challenges of the Asia Pacific century, when tensions between countries such as India, China and the US are expected to lead to possibly violent confrontations in the Pacific.

An important part of the white paper was to replace the Collins with a dozen new and more advanced submarines. The choices were to build a new and ‘’super’’ Collins or acquire either an off-the-shelf European model or a US Virginia class nuclear-powered version.

With no firm decision made, the institute paper posits that Australia could face a ‘’catastrophic’’ scenario involving a failure to overlap properly the phase-out of the Collins with the phase-in of new submarines. Based on Defence estimates of the time required to acquire the new submarines - the first would be operational some time between 2022 and 2034, depending on which model is chosen - the analysts have found that Australia could be left with at most two submarines for the decade from 2027.

Even worse, at its extreme end, the schedule could result in Australia not having a single available submarine between 2031 and 2033.

‘’Defence’s upper estimate is nothing short of catastrophic … in this scenario, Australian submarine capability would essentially be run down and then restarted,’’ the pair write.

It was the rushing into operation of the Collins to avoid a gap between their advent and the end of service of their predecessor, the Oberon class, that resulted in some of their design flaws, and the institute suggests the new submarines could suffer a similar problem.

They also note what they say are continuing problems with maintenance of the Collins, which raise questions about their sustainability over the next two decades.

Since 2006 and according to Defence records, the number of annual ‘’ready days’’ has been steadily decreasing, from about 240 days per submarine in 2005-06 to barely over 100 days in 2008-09, they say. The government stopped reporting on ready days after 2008-09, on national security grounds.

**Greenert: Fleet Operations Pace Unsustainable**

*By Sam Fellman, Navy Times, Apr 16, 2012*

The fleet’s pace of operations is surging and unsustainable as high demand for ships and submarines continues, the Navy’s top officer reiterated at a panel Monday alongside two fellow service chiefs.

Current demands require two aircraft carriers most of the year in 5th Fleet, among many pressing needs.

“We can’t run at that rate,” Chief of Naval Operations Adm. Jon Greenert said in answer to a question about this pace, explaining that the service doesn’t believe it can sustain this through the next five years.

The current amount of support between deployments is generally about right, Greenert said, calling some recent extended deployments — such as the 10½-month-long deployment the Bataan Amphibious Ready Group returned from in February — exceptions to the standard.

“Today, I’d say we’re getting adequate training and maintenance,” said Greenert, speaking to a mixed audience of military and industry at the Navy League’s annual Sea-Air-Space symposium outside Washington, D.C. “And when I say adequate, that’s the majority. But you’re going to have your Bataans every now and again, where you get somebody who is extended because you have a Libya, you have something happen in Somalia, etc.”

In the next four years, the Marine Corps is also planning to reset its pace of operations, which the service’s top general called “fairly frisky” over the last decade of war, estimating that a Marine now typically gets 10 months home for every seven months deployed, a 1 to 1.7 dwell ratio.

“As we re-orient to the Pacific, there will be opportunities for the deployment to dwell to kind of get back in balance,” said Marine Corps Commandant Gen. Jim Amos, who said this ideally would be around 1:3. “But the truth of the matter is if we ever did go back to 1 to 3, I’ll probably have Marines crying and kicking and screaming, wanting to deploy.”

“So there’s a balance,” Amos added.

The Coast Guard is also stretched, with about 15 of 40 major cutters deployed on any day, and missions are expanding, the service’s chief said at the panel.

“For instance, we’re picking up extra mission space with the Arctic opening up. We’re sending one of the national security cutters up there,” said Coast Guard Commandant Adm. Robert Papp. “That’s going to have to come at the expense of some other mission, probably the most likely — we’re going to have to draw down on the drug interdiction mission.”

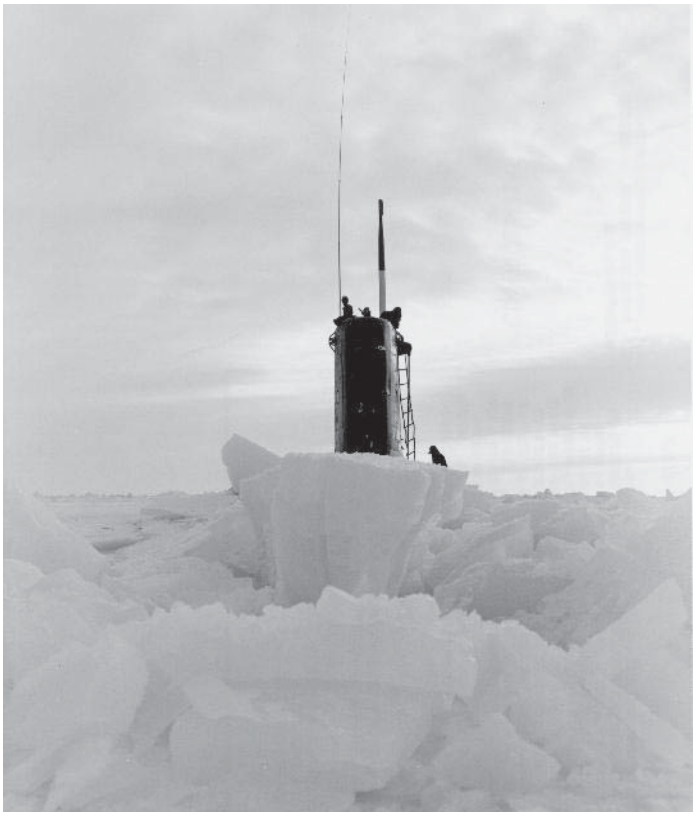
“There are going to be more drugs that get through or there are going to be more fisheries that are left unprotected or something else out there,” Papp said, adding: “We just have to be able to say, ‘You can’t do it all.’”

**Thresher Victim’s Remembered On 49th Annual Anniversary Memorial Service In Kittery**

*By Patrick Archambault, Fosters.com, Apr 16, 2012*

KITTERY, Maine — It was April 10, 1963 when Secretary to the Design Superintendent Rose Marie Dougherty received the ominous message from the USS Skylark, an above sea service vessel.

USS Thresher submarine was conducting sea trails off the coast of New England this day and the two ships were in communication by means of underwater sound telephone. About an hour after the USS Thresher made its deep sea decent, the USS Skylark forwarded a message from the depths of the Atlantic Ocean to Dougherty, “We are experiencing minor difficulties.”



After some garbled messages and difficulties in communicating, it was clear that the USS Thresher fell below the fatal crush depth and thus sank.

The 129 crew members aboard the Portsmouth Naval Shipyard-built USS Thresher when the submarine sank now rest in peace, with the ocean as their graves. 49 years later, about 250 former crew members, shipyard workers, families members and community members gather at the R.W. Traip Academy gymnasium at 1 p.m. Saturday for the 49th Anniversary Memorial Service to honor their loved ones aboard the USS Thresher that day. The ceremony, which began with both the Pledge of Allegiance and the national anthem, had Vice Admiral Kevin M. McCoy, USN, as the keynote speaker.

The ceremony contained a bell tolling where the 129 crewmen were remembered, prayers, a wreath laying and a gun salute for the crew members.

Dougherty, a seacoast resident for 46 years, has been to nearly all of the ceremonies and was present this one. "The Portsmouth Shipyard was so proud of the Thresher because of how advanced it was," she said.

Joy MacMillian, a speaker during the ceremony, is the daughter of USS Thresher's Chief Radioman Walter J. Noonis who was present at the time of the sinking.

"I was 6 years old on April 10, 1963. As I grew, so did my perception that daddy was not ever coming back. Over the last 49 years of these ceremonies, roses are the central flower that comes to mind. Roses were given to survivors as symbols of our strength," she said in her attention grabbing speech.

She went on to read a poem about the tragic beauty between roses and their thorns and closed the speech by saying, "I hold my rose proudly and remember you daddy Jack."

Kevin Galeaz, who served in the Navy from 1975 to 1982 as a Ballistic Missile Fire Control Technician, is a member of the United States Submarine Veterans Inc. for the Thresher Base in Portsmouth and was reader during the bell tolling.

He said his involvement in the organization is to facilitate its purpose, "to perpetuate the memory of our shipmates who gave their lives in the pursuit of their duties."

Galeaz went on to say this memorial was built up to the point where they are not merely remembering the crewmen, but also saving lives.

Next year will be the 50th anniversary for which Galeaz is expecting 1,000 people to be present.

This time it will feature a free live broadcasting service to view online for anyone who cannot be present for the ceremony to. This event is not yet announced, but for more information visit www.thresherbase.org.

**India Finally Gets Its Russian Nuke**
*Strategy Page, Apr 16, 2012*

April 16, 2012: On April 4th the new Russian Akula II SSN (nuclear attack submarine) Nerpa, that was supposed to be delivered to India (which is leasing it) two years ago, was finally turned over. It's worse than it sounds. Three years ago, during sea trials there was an equipment failure on Nerpa that killed 20 sailors and shipyard workers. This delayed sea trials for many months and the Russians found more items that needed attention. These additional inspections and repairs continued until quite recently.

While long rumored, it was only four years ago that India officially acknowledged that it was leasing a Russian Akula II, which was to enter Indian service in 2009. Persistent rumors had it that, two years before, India arranged to lease two Akula IIs, for several million dollars a month per sub. It apparently took this long to train the crews. There were hundreds of sailors and government officials involved in this operation and, while tidbits of information kept leaking out, the government refused comment.

Indian money enabled Russia to complete construction on at least two Akulas that were less than half finished at the end of the Cold War. This was another aftereffect of the collapse of the Soviet Union. Several major shipbuilding projects were basically put on hold (which still cost a lot of money) in the hopes that something would turn up. In this case, it was Indians with lots of cash. But money could not overcome the construction problems and poor design decisions the Russians made. The single Akula II India was leasing was delayed again and again. The 8,100 ton Akula II has a crew of 73. The one leased by India has eight 533mm (21 inch) torpedo tubes and 40 torpedoes.

Meanwhile, in 2009, India launched its first nuclear submarine, the INS Arihant (Destroyer of Enemies). This came after over a decade of planning and construction. What was not revealed at the times was that the Arihant was launched without its nuclear reactor, which was not installed until 2011. Arihant is supposed to be ready for service later this year.

The first of six Arihants will enter service as an SSBN (ballistic missile carrying sub). The 6,000 ton Arihant has four vertical launch tubes, which can carry twelve (three per launch tune) smaller K-15 missiles (with a range of 1,900 kilometers), or four larger K-4 (based on the Agni III) missiles, each with a range of 3,500 kilometers. The K-4 is still in development. Four more Arihants are under construction.

The Arihant is based on the Russian Charlie II sub, which it resembles. A leased Russian Akula II nuclear sub will basically serve as a training boat for India's new nuclear submarine force. Russia retired all its Charlie class subs in the early 1990s. India leased one from 1988-91, and gained a great deal of familiarity with it. The Charlie class had eight launch tubes, outside the pressure hull, for anti-ship missiles.

Currently India also has ten Russian and German diesel-electric subs, and has six French Scorpenes on order.

**Large Displacement UUV Steaming Ahead**

*By David Hambling,* www.aviationweek.com*, April 13, 2012*

The U.S. Navy's Office of Naval Research plans to take robot submarines to a new level. Current Navy unmanned underwater systems (UUS) are small vehicles controlled by an operator nearby, for missions lasting a few hours. The Large Displacement Unmanned Underwater Vehicle (LDUUV) will be large and highly autonomous, carrying out missions at long distances for months. It will act as a mothership, deploying and operating static and mobile sensors for persistent surveillance in coastal waters. Ultimately, it is likely to be armed. The program sounds ambitious, but much of the technology has already been proven.

Boeing's Echo Ranger is setting the pace for LDUUV technology. Originally built in 2001, the Echo Ranger is a 5.5- meter (18-ft.), 5-ton craft that can dive to 10,000 ft. "In terms of autonomous operation, we're pretty much there," says Mark Kosko, program manager for Boeing's Unmanned Undersea Systems group.

The Navy's autonomy requirements call for it to operate without human assistance in shallow water littered with obstacles. In the first 18-month phase the craft will work at shallow depths of as little as 100 ft., calling on an operator via satellite link in challenging situations. The second phase, which will take up to three years, will extend operations to open ocean and working without any human intervention.

The LDUUV will have to detect and avoid surface and submerged vessels, and other hazards such as marine mammals and fishing nets. It will sense and maneuver around fixed obstacles, including piers, moorings and underwater terrain, and plot an efficient course to take.

Echo Ranger has already worked in this type of environment. Sonar gives it short-range obstacle sensing, and acoustic sensors warn of approaching vessels from several miles away. The vehicle then moves out of the way to avoid collision. Echo Ranger's developers have also learned how to avoid static obstacles, sometimes the hard way—on one occasion it got stuck in a kelp bed.

"You only have to learn that lesson once," says Kosko.

Another element of the LDUUV program concentrates on endurance, aiming to boost the amount of energy stored per-pound by 10 times. Again, there will be two phases: the first, taking two years, will see the LDUUV operating for up to 30 days at a stretch, increasing to 70 days in the second phase.

Echo Ranger is powered by batteries with an endurance of 28 hr., although Kosko says diesel engines or fuel cells could prolong that time. These technologies might be difficult to apply on small unmanned vessels, but the LDUUV power unit will weigh 3.5 tons, and Kosko says it is largely a matter of packaging existing technology.

A third development effort addresses reliability needed for longer missions. Again, Kosko says this has been explored with Echo Ranger. Drawing on Boeing's expertise with satellites to airliners, developers have looked at redundant systems, improved component reliability and also self-monitoring capability. The craft needs to be able to compensate for the loss of a sensor, and gauge the seriousness of other problems.

"It has to be able to sense a leak and say 'Hey, it's time to go,'" says Kosko.

The LDUUV will have a large payload bay, making it capable of releasing sensors, communication buoys, smaller UUS and weapons. The Navy's current emphasis is on persistent surveillance "over the horizon." However, its most significant impact could be in mine warfare, both offensive and defensive.

In the counter-mine role, the LDUUV will be able to detect and locate mines, then engage and neutralize them safely. And the LDUUV could make offensive mine laying more controllable and clandestine. In the transformational mine concept, the LDUUV lays networked sensors across a wide area. These track and identify every vessel within range. Depending on the situation, any vessel can be engaged, by either an anchored weapon or a torpedo from the UUV itself. The advantage of using an LDUUV is that the minefield can be switched on or off, or changed in size. It can be emplaced in advance, and never activated. De-mining and clear-up do not pose the major problem that they do with traditional mines.

The Navy plans to release a request for proposals for the LDUUV in 2014. Last October Rear Adm. Barry Bruner, the Navy's undersea warfare director, indicated that up to 10 LDUUVs would be procured. The LDUUV is being pitched as a helper to complement manned submarines. However, if it achieves the technology goals for endurance and autonomy, it will pose serious questions of what exactly large unmanned craft could not ultimately do.

**Experts out to solve deep-sea mystery of the USS Scorpion**

*By Dan Vergano, USA TODAY, April 11, 2012*

Shipwreck disaster experts are calling for a deep-sea expedition to a lost U.S. nuclear attack sub, the USS Scorpion, in an effort to verify a new theory on what caused the Cold War vessel to sink.

The Scorpion was lost May 22, 1968, killing 99 men, about 400 miles south of the Azores Islands in the middle of the Atlantic Ocean. The sub has been inspected by undersea recovery teams, including a visit in 1985 by oceanographer Robert Ballard before his team's discovery of the Titanic shipwreck. The cause of the sub's loss has remained hotly disputed. A Navy Court of Inquiry found "the cause of the loss cannot be definitively ascertained."

"The families of those 99 men are still out there, and they want to know what happened," says former U.S. naval officer Paul Boyne, who presented a new mechanical explanation for the loss of the sub at a recent marine forensics symposium just outside Washington. Panelists at the event called for a summer expedition to the sub's wreck, led by P.H. Nargeolet, another Titanic explorer, saying it might put to rest a multitude of theories about the Scorpion's demise — ranging from a covert Soviet attack to a torpedo self-firing into the ship to a faulty trash disposal.

Evidence for a more mundane explanation comes from the sub's propeller shaft, Boyne says. Undersea photographs show it rests about 20 yards outside the wreck on the seafloor, about 11,220 feet underwater. Boyne suggests that rubber bearings holding the propeller shaft failed, putting stress on the coupling connecting it to the engine. The coupling's bolts failed catastrophically during a deep test dive, the theory goes, spilling water into the sub too rapidly to allow ballast maneuvers to raise the ship to the surface.

As support, Boyne points to the loss in 1963 of the USS Thresher, the only other nuclear submarine lost by the Navy. The Thresher suffered a similar crushing end but retained its propeller shaft within its hull.

In its planned proposal to the U.S. Navy's Naval History & Heritage Command (NHHC) in Washington, the team would send a robot sub to the wreck to photograph the displaced shaft. The robot would send a small tethered camera into the ship's engine room to examine the damage to the coupling bolts.

Because the sub carried two nuclear-tipped torpedoes and a nuclear reactor, the Navy has periodically tested the water around the submarine for radiological releases, at least as recently as 1998.

"What happened to the Scorpion isn't so much a mystery, as a secret," says Ed Offley, author of Scorpion Down: Sunk by the Soviets, Buried by the Pentagon, which argues for the covert Soviet sub attack explanation.

Investigators who start from technical documents related to the ship's loss, typically differ with his interpretation, he says, which was based on interviews with Navy personnel.

"It couldn't hurt to have a documented expedition to Scorpion," says Offley, who is not a member of the proposed expedition team.

On May 27, 1968, family members of the USS Scorpion's crew waited on a Norfolk dock for the return of the submarine. At least 11 of them have joined in the call for the expedition.

**The Chinese navy is betting big on its new submarine hunting drones**
*By Eloise Lee and Robert Johnson, BusinessInsider.com, April 11, 2012*

Tackling the long-time nuisance of American submarines off its coastal waters China is deploying drones to its Navy ships.

While not a new development on its own, there are reports of increased drone deployment to the PLA's ships, and a heightened attack against U.S. drone contractors.

UPI reports Chinese hackers have ramped up their barrage of infected emails to glean as much information about the Pentagon's UAV strategy and development as they can.

It's no secret that the Chinese military is in the habit of copying foreign hardware, and while drone technology was previously limited to the U.S. and its allies — that's over.

China began developing UAVs in the 1960s just as several American AQM-34G - R models were lost over the Chinese mainland. Spy Flight says one drone was recovered by the Chinese, who maintain they shot it down.

In 1969 China began reverse engineering the drone at the Beijing Institute of Aeronautics and Astronautics in an eager bid to figure out the American technology and use it for themselves.

By 1972 the U.S. drone was copied into the WuZhen-5. And when China invaded Vietnam during the war of 1979, China's first drone was used to successfully collect visual intelligence — a chilling example of how good China is at counterfeiting military hardware.

But being based on a drone from the 1960s, the Wuzhen-5 is nowhere near as sophisticated as U.S. drones.

And that's why China would be keen to inspect the American RQ-170 Sentinel stealth drone, which Tehran was able to capture last year.

The "Beast of Kandahar" went down to much Iranian fanfare, and after doubts about the drone's capture were put to rest by its display on PressTV, questions of how great a loss its capture is to U.S. intelligence continue to linger.

There was speculation in February the drone went down with its data still intact and the folks at DARPA told Wired that there is little doubt the Russians and the Chinese were brought in to help with reverse engineering the advanced American aircraft.

When Beijing gets around to using the Sentinel's technology in its own fleet of drones, there is little doubt it will be used to patrol China's vast coastline and maritime territory using the genetic algorithms already employed by its older drones to hunt for submarines.

American subs in Asian waters are a definite burr in Beijing's saddle and are the one true soft spot in the Asian nation's military buildup. The U.S. routinely has 10 forward deployed subs in the world's oceans at any given time and in the event of Chinese hostilities they would slip into the area as quietly as possible.

China's best defense would be its unique algorithms in a fleet of drones, patrolling the coast, using information from sonar buoys to track the American subs. Whether the Sentinel's technology will aid the Chinese in their efforts has yet to be seen.

**Memorial for Thresher long overdue**
*D. Allan Kerr, Thresher Memorial Project Group, Seacostonline.com, April 8, 2012*

This month, as they do every year, surviving family members will gather in Kittery, Maine, to honor the 129 men who perished in the sinking of the fast-attack nuclear submarine USS Thresher in April 1963.

The loss of the Thresher (SSN 593) during deep-dive trials off the New England coast remains the worst submarine disaster of all time. The tragedy particularly resonates here on the Seacoast, where it embodies the symbiotic relationship between local communities and Portsmouth Naval Shipyard. Thresher was built and home-ported at the yard, and civilian employees working side-by-side with Navy sailors were lost when the submarine imploded that morning. They entered those unknown depths together on a shared mission, and they made the ultimate sacrifice together.

The families of these lost pioneers gather with local submarine veterans each April for a memorial service in remembrance of that sacrifice. On April 14, the ceremony will be held at Traip Academy. In the meantime, efforts are under way to establish a more permanent reminder in the town Thresher called home, to coincide with next year's 50th anniversary of the disaster.

Current plans call for the dedication of a memorial at the former Kittery Traffic Circle, to be highlighted by a 129-foot flagpole visible from Interstate 95 and showcased by floodlights 24 hours a day. The height of the flagpole will commemorate the 129 brave sailors and civilians who went down with the submarine.

The flag is to rise from a rounded black granite base, with cherry trees and appropriate ornamentation augmenting the memorial. Sidewalks, benches and other improvements are to be installed around the surrounding area as well. And in this corner at least, there is hope the site will be renamed USS Thresher Memorial Circle, but I suppose that's an issue for another day.

More importantly, a long overdue tribute will be paid to those lost aboard SSN 593. Members of Thresher Base — the local chapter of U.S. Submarine Veterans — and the families meeting here next weekend recognize that their loved ones are heroes, and it's time they be celebrated as such. They aren't heroes just because they died; they're heroes because they undertook a dangerous mission, they were fully aware of the possible consequences, and they went anyway.

In my mind, they're heroes the way astronauts are heroes, exploring the depths of the sea where few others have gone just as their counterparts explore the frontiers of space. And they did it in defense of their country. Just imagine riding in an oversized cigar tube under a thousand feet of water. If something goes wrong, there's nowhere to go; you don't even have the option of jumping overboard.

The ongoing hype for this month's 100th anniversary of the Titanic sinking serves as a stark reminder of how little the general public knows about the Thresher. The submarine fleet is at times appropriately referred to as the "silent service," but while stealth is an essential component of its success, it has also perhaps deprived submariners of the public acclaim they are due. Their accomplishments are invisible, taking place far below the ocean's surface and out of sight.

Thresher was the most advanced submarine of its day, the first of its class, created during the height of the Cold War to "hunt and kill" Soviet subs. During its fatal dive, the submarine was reportedly near its maximum test depth of 1,300 feet when its nuclear reactor shut down, causing the crippled vessel to plunge to the bottom of the sea. It was crushed by enormous water pressure as it sank, instantly killing all on board.

Today, Thresher rests in several broken fragments beneath 8,400 feet of water on the ocean floor. However, its loss served as a catalyst for major changes in submarine safety known as SUBSAFE, which has prevented similar catastrophes from occurring.

For more than two centuries, from sailing ships to nuclear submarines, the Navy yard and its Seacoast neighbors have worked together to keep our country safe.

The memorial targeted for next year's anniversary will pay tribute to a tragedy, but it will also serve as a celebration of what this partnership has been able to achieve in defense of our nation's freedom.
It will serve as a reminder of those aboard Thresher, and other lost submariners as well, who are Forever on Patrol, Never to be Forgotten.

**N.K. Submarines Drop Below Seoul's Radar**
*koreaherald.com, Apr 5, 2012*

Several North Korean submarines have disappeared after departing from bases on the eastern coast.

According to reports, three or four North Korean submarines recently departed from bases on the east coast and have since remained outside South Korean surveillance.

The submarines are thought to be 370-ton shark-class vessels. The North Korean submarine used in the attack on the Cheonan in March 2010 was a 130-ton salmon-class vessel. North Korea has between 70 and 80 submarines ranging from 1,500-ton vessels to 130-ton vessels. Of the total, 80 percent are said to be based in the East Sea, where the waters are deeper than the West Sea, providing better conditions for submarine operations.

"North Korea appears to be increasing submarine infiltration exercises with the weather getting warmer. However, the possibility that drills could hide provocations has not been ruled out and related activities are being closely monitored," an unnamed military source was quoted as saying by a local daily. The Navy's public relations department did not confirm the reports.

In a separate development, North Korean leader Kim Jong-un visited an outpost on an East Sea island, the North Korean state media Korean Central News Agency reported on Wednesday.

The news agency reported that Kim told the troops stationed on Ryo Islet to "bury all enemies at sea" if a confrontation occurs, and to strengthen the defenses of the islet as "an iron wall" to prevent invasions.

The visit to the East Sea base was Kim's first public visit to a military base since he attended an army-navy-air force joint exercise on March 15.


Bob Bissonnette at Submarine Birthday Ball

# Commanders Corner
# MAY 2012

Hello All,
Looks like we are still having our Spring showers. I had a Great time at the 112th Submarine Birthday Ball. Ran into lots of old shipmates that I served with on the many boats I was on. This years Old Timers Luncheon and Birthday Ball was dedicated to CJ Glassford and all that he had contributed to our organization and our Submarine force. For all he did to hold the bonds between USSVI, CSS-11, and Sub Base. You can say he was an inspiration, if not a force factor for getting things done. Soon I will have a copy of CJs burial at sea video and will show it at the 1st meeting when I get it. Put it this way, Chaplin Lee from CSS-11, the CO, COB, Officers, & Crew of the USS SAN FRANCISCO did an Outstanding & Honorable job in performing this duty, it had an Admiral and myself in tears.

So much for Sub Ball...The Linda Vista parade went well and would of been better if we had more than 6 people there for it. Ed Farley & Jack Kane, thanks for getting us invited to the parade & organizing our group for the parade. Thanks for everyone who could make it. Hopefully, Jack was able to get some good Pictures!!!!

As you all know, or hope you know, we have been working on our float for the next parade. Our next parade is the Ramona Main Street Parade on the 19th of May at 1000. Jack will have more info at the next meeting and by email.

I'm currently looking at the 21st or 22nd of July for our Annual Joint Picnic on Sub Base (Sat. or Sun). I'm going to submit the request for 2 boat tours for the day of our picnic. The times will be the same as last year, 10am & 1pm. I will put out more info on the tours later when we firm up a date for the picnic. The Sub Base MWR are working on getting at least 1 horseshoe pit if not 2. If not, I'm sure we will find a place to set one up like last year.

That's all for now, God Bless & smooth sailing to all. I wish you & your families a very happy, safe & fruitful summer.

Sincerely,
Bob Bissonnette
Base Commander

## The Robotic Army Closes In On Iran

www.strategypage.com*, May 1*

In response to recent Iranian sabre rattling the United States has moved two carrier task forces and one SSGN (nuclear powered cruise missile submarine) to the Persian Gulf. While this puts about 80 carrier based combat aircraft in area, it also brings over 400 Tomahawk cruise missiles. Used in large quantities, these weapons have proved devastating. For example, on March 19th, 2011, the initial NATO attack on Libya involved over a hundred Tomahawks, most of them fired from a single SSGN.

The U.S. has four Ohio class ballistic missile submarines (SSBN) that were converted to SSGNs. These boats entered service over the last six years, and Libya was the first time one of them fired its missiles in combat. Each of these Ohio class SSGNs carries 154 Tomahawk cruise missiles, and provides space for 66 commandos (usually SEALs) and their equipment. The Tomahawks used in this kind of surprise attack are very effective at destroying air defenses, and other weapons that tend to be sent to into hiding once a war begins. The latest Tomahawk can be redirected while in flight, and UAVs and spy satellites can provide real-time observation of key targets to make this work.

The current Tomahawk, the Block 4, costs about $1.8 million each, weighs 1.4 tons, has a range of 1,500 kilometers and carries a half ton warhead. It moves to its target at a speed of 880 kilometers an hour. The Tomahawk was introduced 29 years ago, and over 6,000 have been manufactured. The U.S. Navy has fired nearly 2,000 in combat and training.

The Block 4s are also getting upgraded so that they can hit moving targets. This is mainly intended to turn the Tomahawk into an anti-ship missile, although it can also hit moving land targets. The Tomahawk has been a primary land attack weapon for surface ships and submarines since the 1990s. The Block 3 entered service in 1994, but the Block 4 was a big upgrade, adding GPS and the ability to go after a different target while the missile was in flight.

The cruise missile, when it showed up in the 1980s, was one of the first UAVs, it just wasn't reusable. UAVs that carry bombs and missiles, and can be reused, are going to provide competition for cruise missiles. That said, cruise missiles travel low and slow and can be shot down. That will always give them an edge against more expensive reusable UAVs.

## China reports U.S. can track only half of PLA sub fleet; Conflict with Philippines

*Missiledefense.wordpress.com, April 30*

Of all the weapons platforms available to China's military forces in the South China Sea, the PLA Navy's 70-plus submarine fleet is the most lethal.

If a war were to break out in the area, the U.S. could only track about half of China's submarines, which would allow the PLA Navy to exert overwhelming deterrence within a very short period of time and deal the U.S. Navy a deadly blow.

Furthermore, China's subterranean submarine bases in Hainan Island would enable PLA Navy submarines to reach the deep sea area within 20 minutes, enabling them to control the entire region.

This is the conclusion of a rare report on China's submarine forces published April 20 by the state-run hinews.cn, the online version of the Hainan Daily, the mouthpiece of Hainan Province's Communist Party. Hainan Province is the home base of China's largest submarine fleet, located at the southern tip of the Hainan Island.

The report confirms what U.S. intelligence has observed with regard to the PLA Navy's recent deployments during the tense standoff between Chinese maritime surveillance vessels and Philippine naval ships near Scarborough Shoals near the southern edge of the South China Sea.

The report coincides with the publication of another article in the official People's Daily calling for a small-scale war with the Philippines over the Scarborough Shoal standoff.

"China should try to seize more initiative in this process, rather than being led by other regional players," the People's Daily article stated. "China should be prepared to engage in a small-scale war at sea with the Philippines. Once the war erupts, China must take resolute action and deliver a clear message to the outside world that it does not want a war, but definitely has no fear of it."

In fact, according to hinews.cn, at least one of the three PLA Navy's Type 094 Jin-class nuclear-powered ballistic missile carrying submarines (SSBNs) stationed at the Sanya submarine base has been deployed to the South China Sea for patrol duty. The SSBN is China's strategic deterrence weapons platform. Earlier this year, it was reported that a new type of submarine-launched ballistic missile (SLBM) called Julang-II was successfully test fired from a Jin-class SSBN. It has a reported range of 8,000 kilometers, or about 5,000 miles.

*Rebirth Of Russia's Submarine Fleet, Construction*

## The Submarine Fleet is Traveling on the Surface: The Renewal of the Submarines is Moving with Seven-Mile Steps

*NEZAVISIMOYE VOYENNOYE OBOZRENIYE (RUSSIA), April 30*

**MOSCOW —** Submarine forces traditionally occupied a significant, and over the extent of a series of historical periods - even a leading place in the system of combat assets of the domestic fleet. And this is fully logical - over the extent of decades the Soviet Navy sought to use submarines to counter powerful Western surface fleets in the battle for superiority at sea.

The introduction on submarines from the end of the 1950s of nuclear power and missile weaponry finally transformed submarines into a powerful means not just of naval warfare, but also into a strategic weapon of deterrence of colossal power. Thus, submarines deservedly earned the status of the basis of the USSR's Navy, and now also of Russia's.

The modern nuclear submarine (SSN) represents, according to a well-known American expression, "the ship of the line of the 21st-century," and is an unprecedented combination of combat reliability, covertness, mobility, unlimited autonomy and the highest combat potential in the conduct of naval warfare. Taking into account the great experience in designing, building and operating SSN, it is fully logical, that Russia's Navy used the development of SSNs as a cornerstone of naval construction.

**Strategic Foundation**

The special role of the submarine fleet in Russia's contemporary condition is reinforced by the circumstance, that at the end of the 1990s a line was chosen toward the development of naval strategic nuclear forces (MSYaS) as the basis of Russia's strategic potential as a whole. Concretely this is expressed in the establishment, as a super-priority program, of the construction of fourth generation strategic nuclear missile submarine cruiser's of Project 955 (Borey), developed by Petersburg's Rubin TsKB MT [Central Design Bureau for Naval Engineering] and the creation for them of the R-30 Bulava strategic missile complex.

Thanks to the great efforts of the designer (Rubin TsKB MT), industry and the leadership of Russia's Navy, the program entered, finally, into the stage of achieving practical results. Initial construction at the Severnoye Mashinostroitelnoye Predpriyatiye [Northern Machine Building Enterprise] (SMP), as early as in 1996, of lead ship of Project 955 the Yuriy Dolgorukiy, is in the concluding stage of testing, and sea tests are also being carried out on the second one-of-a-class boat, the Aleksandr Nevskiy. Both of these ships will be turned over to the Navy in 2012. After long drawn out development,& the testing of the Bulava solid-fueled submarine-launched ballistic missiles (SLBM) was crowned with success, which made it possible to pose the question of their acceptance into the inventory and the beginning of series production in 2012.

At the present time, construction of a third Project 955 ship, the Vladimir Monomakh, which was laid down in 2006, is being carried out on the SMP ways. In total according to the State Armaments Program the entry into the battle order by 2020 of eight Project 955 missile carriers is being proposed, and for this, beginning with the fourth ship, they must be built according to the modified Project 955A with an increase, in particular, in the number of SLBM launchers from 16 to 20. The first ship of the modified class is already in fact being built at SMP and is at a significant stage of readiness, although the official keel-laying ceremony is expected only this year.

The construction program for Project 955 SSBN and the creation for them of a missile complex is, apparently, the most large scale and expensive Russian state program of the last decade. At the same time simultaneously being carried out, though less noticeably, but nearly just as important, is a program of renewal with repair and modernization of the existing basis of the current Russian MSYaS, six Project 667BDRM SSBNs, which are part of the Northern Fleet. In the process of modernization the rearmament of these boats, introduced into the order of battle bet ween 1985 and 1992, with new liquid-fueled R-29PMU2 Sineva SLBMs and their modernized variant, the Layner, is being accomplished. Now the cycle of the second medium repairs of Project 667 BDRM boats has been begun.

In the battle order of the Pacific Fleet for now there remain as well three of the Project 667BDR SSBNs of 14 built in 1976-1982, which in the short and medium term future will finally be replaced with Project 955 boats. A modernized heavy SSBN, the Project 941U Dmitriy Donskoy, remained in the Northern Fleet as a ship to test the Bulava missile complex. An additional two Project 941 boats remain in reserve without missiles. The fate of all three Tayfuns has been predetermined.

**Strike Force Of The Fleet**

The combination of nuclear submarines with cruise missiles and nuclear powered submarines will remain the basis of the non-strategic combat potential of the domestic Navy for the foreseeable future.

At the same time the economic difficulties of the decade and a half following the collapse of the USSR led to a serious collapse and a reduction of those forces. Thus, of 13 Project 949 and 949A submarines built in 1980-1995, optimized for "hunting" aircraft carriers, at the present time there remain only nine within in the fleet's inventory, of which 4-5 are in operating order. The developer of these boats, Rubin TsKB MT at the present time developed a project for the modernization of those ships with their equipment with new missile weapons, that will make it possible to provide for the presence of the submarines within the composition of the fleet for an extended time.

Of the Soviet design nuclear multi-purpose submarines on the register of Russia's Navy there remain 20 - 12 third-generation Project 971 SSNs and (six each in the Northern and Pacific Fleet), four third-generation Project 945 and 945A SSNs with titanium hulls (in the Northern Fleet) and four of the last "second and a half generation" Project 671RTMK (also in the Northern Fleet). Of this number, a total of only 10 - 11 remain in operating condition, which, understandably, is completely insufficient. The question of providing for the repair and modernization of the Project series 971 and 945 remaining in the Navy, and which given the necessary technical content can still serve in the battle order from 15 to 20 years, is becoming quite urgent.

Now primary reliance in the renewal of the fleet of nonstrategic multipurpose SSNs was placed on the construction of new fourth-generation Project 885 SSNs (codename Yasen) developed by the Malakhit SPMBM [St. Petersburg Maritime Machine-Building Bureau]. The ships in question possessed broad combat capabilities, housing the new Oniks anti-ship missiles, able to inflict missile strikes on surface and coastal targets. The lead boat out Project 885, the Severodvinsk was laid down at SMP as early as in 1993, and over an extended period of time a literal struggle for the survival of the project was carried out. Nonetheless, now the Severodvinsk was completed, and testing is underway and it must be transferred to the Northern Fleet in 2012.

In 2009, the SSN Kazan of the modernized Project 885M was laid down at SMP. In the fall of 2011 a contract was signed for the construction at SMP both of the Kazan, as well as an additional four Project 885M boats. And in total according to the State Armaments Program Until 2020, it is proposed to introduce 10 Project 885 and 885M submarines into the Navy order of battle.

**Non-Nuclear Submarines Retain Their Value**

Along with the construction of SSNs, Russia's Navy is continuing to devote attention to the construction of non-nuclear submarines, in the first place for operations in the close-in sea area and in "enclosed" seas. The traditional developer of nonnuclear submarines is TsKB MT Rubin. 19 diesel-electric submarines from Project 877 of the 24, built from 1980 through 1994, are serving in the domestic fleet. Of these 19 units, nine ar e located in the Pacific Fleet, seven - in the Northern Fleet, too - in the Baltic Fleet and one is part of the Black Sea Fleet. Work on their repair and modernization is being accomplished. Simultaneously these boats continue to enjoy export success, and since 1986, 31 Project 877E and 877EKM and their modifications - Project 636 - were built for foreign buyers, and at the present time a contract for the construction of six Project 636 boats for Vietnam's Navy is being fulfilled.

The Project 677 (codename Lada) is among the new fourth generation diesel-electric boats. The lead boat of this class, the St. Petersburg, was built at Admiraliteyskiye verfi from 1997 and after extended testing was transferred to Russia's Navy in 2010 and is in operation experimentally. Realization and shakedown of that project has come up against a series of technical difficulties, which at present time they have basically overcome. This opens up the possibility of accelerating rebuilding for the modernization projects of still another two one-of-a-kind boats - the Sevastopol and the Kronshtadt - for the RF Navy. Navy Commander-in-Chief Vladimir Vysotskiy personally excellently understands the need for the development of Russia's non-nuclear submarine fleet, which cannot be perpetually based on the excellent, but beginning to become obsolete Project 636, nor can it be permanently improved. The admiral in connection with this steadily follows the development of Project 677, taking all necessary efforts to make it a reality. In future the boats of the modified Project 677 will begin to replace Project 877 in the fleet.

For now Russia's Defense Ministry as measures to accelerate the renewal of the Black Sea Fleet inventory ordered six Project 06363 submarines, which represent the next version of the well-developed Project 636. Now the first two boats, the Novorossiysk and the Rostov-Na-Donu have already been laid down at Admiraliteyskiye verfi, and the construction of all six boats is planned for completion by 2018.

In future, the TsKB MT Rubin will develop its own design for an air-independent power plant with an electronic generator for submarines. In the more distant future it will be mounted in the modified Project 677 boat. This project may well result in significant opportunities to increase the combat effectiveness of submarines.

Thus, it can be stated, that after the period of the extended post-Soviet collapse in recent years a process of renewing and rebirth of Russia's Navy submarines was begun. Along with the completion of the construction and the initiation of testing of the lead submarines of the new project 955, 885 and 677, a process of repair of submarines within the inventory of Russia's Navy has been activated, and the intensity of combat training in operational service by Navy submarines notably increased. Large-scale programs for the series construction of new generation submarines have been put in motion, then the creation and improvement of future weaponry for them is being carried out. All of this makes it possible to hope, that as soon as after several years we may with our own eyes see a renewal of the submarines of Russia's Navy.

## The Mysterious Iranian Threat

*strategypage.com, April 30*

For the United States, the most dangerous and unpredictable naval weapon Iran has is its fleet of twenty submarines. This is a relatively recent development and it's unknown how effective this force might be.

The world may soon find out as Iran, under increasing economic sanctions because of its nuclear weapons program, has responded with threats of violence.

The subs are a large part of that threat. The U.S. is not revealing what it knows of Iranian submarine warfare capabilities.

That's normal, for it the Iranians knew what the Americans knew, they could tweak their own plans to deal with likely U.S. countermeasures. Most likely (based on Cold War practices) the U.S. has been using aircraft, satellites, subs and underwater sensors to monitor the activities of Iranian subs at sea. This would involve violating international law by quietly moving into Iranian territorial waters.

But this has been done before, and the Iranians a probably aware of it (but not willing to publicize it, and the fact that they have not been able to do anything to halt the American incursions).

The Iranians tend to be smart when it comes to technical and military matters, and they are aware that the U.S. has over a century of experience in submarine operations.

Have the Iranians come up with ways to overcome their shortages in technology and experience? No one will know unless the Iranian subs go to war.

Iranian efforts to build a submarine force began in the late 1980s, when the Islamic Republic of Iran Navy acquired a few midget subs from North Korea.

These boats were capable of delivering frogmen covertly, or carrying naval mines to attack shipping and harbors.

Iran took the big leap in the early 1990s when they acquired three Kilo Project 877/636 type diesel electric submarines from Russia. The 2300 ton Kilos are long range subs capable of operating throughout the Indian Ocean (from South Africa to Australia).

The Kilos have six 533mm (21 inch) torpedo tubes and 18 torpedoes (including one or more Shkval rocket torpedoes), or 24 mines. Very similar to the world-standard diesel submarine, the 1800-ton German Type 209, the Kilo is a formidable foe and can stay at sea for up to 45 days.

The last of these three Kilos were delivered in 1996, which gives Iranian crews more than a decade of experience. Google Earth has often spotted the trio tied up in harbor at Bandar Abbas; however, they have made several training cruises to the Persian Gulf and Arabian Sea.

Russia agreed to stop selling subs to Iran in 1996 and since then Iran has been working on their own designs. After ten years of trial and error, they produced the 100 ton Ghadir (Qadir) class vessels in 2005.

Iran currently has 12 of these small diesel electric subs. These smaller Ghadir-class vessels are squarely between the old midget submarines and the Russian Kilos. The Iranians are not releasing specification sheets to anyone but they look very similar to the Italian made Cosmos SX-506B submarines that Columbia received in the 1980s.

The 100-ton SX-506Bs are only large enough to carry commandos and mines. However news photos show what looks like to be two torpedo tubes on the Iranian craft.

It should be remembered that Cosmos exported a number of larger vessels to Pakistan in the 1990s. Dubbed the SX-756, they may have been the design basis for these Ghadir. It should also be acknowledged that the North Korean Sang-O class submarine closely approximates the Ghadir type. In 2007 North Korea gave Iran outright four of its Yugo-type midget submarines. These Yugos were well worn 90-ton 65-foot craft but Iran accepted them all the same.

There also appear to be five larger Nahang class subs. The first one appeared six years ago. At about 500-tons it is the same size as and closely resembled the old German Type-206 class.

The Type 206s were produced in the 1960s for operations in the confined shallows of the Baltic. Denmark, Norway, Germany and now Indonesia used variants for forty years. The Type 206's size enabled it to carry eight torpedo tubes with no reloads.

The Iranian version does not seem to be a success and little has been seen of this craft.

Under construction is what will be the third indigenous Iranian design. Laid down in 2008, the Qaaem is a 1000-ton boat and should be large enough to handle a full set of torpedo tubes along with a reload.

They could be the possible replacement for Iran's Kilos. The Kilo platform has a lifespan of 30-years and they are more than halfway there. But Iran has a mixed record when it comes to warship construction, and the Qadir boats are reported to be troublesome to use and not safe.

The Iranians are enthusiastic about having more subs, but developing that capability is very expensive and time consuming.

## **Subject:** Fwd: Sculpin Ops declassified

Shipmates,
There are not very many OPs that are of a declassified nature involving Nuclear subs. Fortunately this one had nothing to do with the cold war and is available.

Fraternally Yours
Marlin Helms

## *USNI Naval History article on USS Sculpin*

*The Sculpin's Lost Mission: A Nuclear Submarine in the Vietnam War*
*By Admiral Charles R. Larson, U.S. Navy (Retired), with Captain Clinton Wright, U.S. Navy (Retired), and Paul Stillwell*

One would expect that Cold War "special ops" involving U.S. nuclear-powered submarines are shrouded in secrecy.

Other American sub activities during that era, however, are also hidden, one for a very strange reason.
In 1971, after he had spent two and a half years of duty in the White House as naval aide to President Richard Nixon, Commander Chuck Larson was ready to go back to sea. He was ordered to be executive officer of the attack submarine Sculpin (SSN-590), under Commander Harry Mathis. For several months the boat went through workups off the coast of southern California to prepare for a deployment to the western Pacific. That deployment included active participation in the Vietnam War.

After leaving the West Coast in January 1972, our first assignment was a classified special operation that lasted about two months. It went very well. The mission helped us hone our ship-handling and intelligence-gathering skills and made us confident in our capabilities and feel good about the way the ship was operating. Although it is still classified after all these years, it's safe to say that it was intelligence-gathering targeted against the Soviet Union .

Years later, Sherry Sontag and Christopher Drew's book, Blind Man's Bluff (New York: Public Affairs, 1998), described Cold War submarine operations. Because of security concerns, I can't specifically discuss the contents, but the book is a good read.

After the special operation, the Sculpin went into Yokosuka , Japan , for some liberty, and my wife, Sally, met me there. I had grown my beard while at sea and that, combined with my black hair and pale complexion after the extended period underwater, made me look according to Sally like Rasputin, the mad tsarist Russian.
In March, shortly after we began our second operation, patrolling the South China Sea , we were diverted for a specific mission. The U.S. government believed supply trawlers were operating out of Hainan Island , off the southern coast of the People's Republic of China . They were running arms, ammunition, and supplies from the northern part of the Gulf of Tonkin down to the Vietcong in the IV Corps region, the southernmost portion of Vietnam . U.S. forces discovered this when ground troops caught the enemy in the act of off-loading a trawler on a South Vietnamese beach. The incident sparked a big firefight, creating the legend that the trawler crews were elite forces willing to fight to the death. It also initiated a concerted effort to stop the traffic by convincing the enemy that it could not succeed.

Each of the trawlers could carry about 100 tons of munitions. Several suspect ships were photographed, so we knew generally what they looked like, but as long as they were in international waters, we had no means to interdict them other than to turn them around by making low passes with a P-3 Orion patrol plane or a close approach by a surface ship. This was complicated by the fact that so many legitimate trawlers like them were in the area. Several gunrunners had been turned around, but this would not stop the at-sea resupply effort. To convincingly discourage the effort, it would be necessary to destroy them in the waters off South Vietnam before they could land their cargo. The plan that evolved was to use a submarine to follow one from Hainan to South Vietnam and finger it for our forces to destroy. We were selected for this mission.

**The Pursuit Begins**
We took up a patrol station off Hainan on 10 April. After referring to a book with images of the different types of trawlers and what we could expect, we picked up our quarry on 12 April. The wardroom was divided on whether she was a good prospect. However, the ship resembled photographs of other known suspects,

and her projected track was taking her toward the west coast of the Philippines , which did not make sense for a fisherman. So we took off in trail. Not long thereafter, the trawler turned to the south, and that was the clincher for us. She had an extremely distinctive shaft rub and propeller sound, which our sonarmen could easily discriminate from background noise. We relied completely on passive sonar to avoid being detected. The active sonar in the Skipjack-class submarines wouldn't have been reliable because of the reverberations in shallow water.

The ship we followed was probably 200 feet long, a large trawler, certainly suitable for open-ocean fishing. We did, of course, identify her by periscope before we started to trail, but we weren't able to follow her totally by periscope and maintain visual contact. We didn't want to take the chance of having our periscope seen in the flat, calm waters of the South China Sea . Also, she was making a speed of advance through the water of about 11 knots. That meant that if we were going to do our periscope operations every now and then, get out radio messages, and do our required housekeeping evolutions, we were probably going to have to run an average of about 18 or 20 knots submerged to keep up with her. We also had to include time for ocean analysis and tactical maneuvering to make certain we were staying with the correct target.

One more challenge was that the trawler was heading south, right through the "dangerous ground." On charts of the South China Sea , an area about 180 nautical miles wide and 300 miles long is simply labeled dangerous ground. Our charts had one track of soundings through that area taken in 1885. We assessed that the terrain was fairly level, but the depth was 200 feet or less in most of this area. So we were in a position of running up to 20 knots in 200 feet of water, with between 30 to 80 feet under the keel at that high speed. Our ship could react very quickly to plane (control surface) movements, so we had only our most experienced officers of the deck, diving officers, and planesmen on station. Our chief petty officer diving officers controlled the ship's depth by supervising the planesmen. They did a superb job.

As the trawler headed south, she vectored a little to the east and went into an area in the dangerous ground where we couldn't go. Up to then, although we were in the dangerous area, we felt secure in knowing the bottom was fairly level. But now she went into an area that was littered with rocks, shoals, and shipwrecks. I wondered then if the trawler's crew was smart enough to do what we called a "sanitization move"â•"go where even surface ships wouldn't follow. She doubtlessly believed that if she went through there she would come out the other side well clear of any tailing vessel.

I was absolutely convinced that the trawler was unaware of our presence (that became clear later when we intercepted a radio message). We believed the ship's course change was simply a safety move. While we were able to use our fathometer to plot the bottom and know the depth under our keel, the device looks only directly down; it doesn't look ahead. We were genuinely worried about what we couldn't see ahead an undersea mountain, a wreck, or something else.

**Lost and Found**

When the trawler had entered the dangerous ground, we requested cover from an on-call P-3 Orion. Although we were under the operational control of the U.S. Military Assistance Command, Vietnam (MACV) in Saigon , we had the ability to call the shots on the scene. We wanted the aircraft to remain covert, so it would not scare the trawler back into port by making low passes near her. During the ship's voyage through this very shallow, wreck-strewn portion of the dangerous ground, the plane, remaining at high altitude to minimize the chance of being seen, kept track of her by radar and visual observation. We dodged around the area by hauling off to the west, then south, and finally back to the east, to an area where we predicted the trawler would emerge, still in the dangerous ground. As the P-3 turned the contact over to us, the trawler appeared just about where we thought she would. We picked her up from the distinctive shaft rub and propeller sound and got in close enough to get a good positive periscope observation. We then went back in trail.

As we headed south in the South China Sea , we approached a new hazard. We found a large number of oil-drilling platforms near the coast of Borneo . We first became aware of this hazard through the prolonged tracking of a diesel contact, which prompted the CO, Commander Harry Mathis, to go up to periscope depth for a look. We spotted an uncharted platform. If the rigs were operating, that was no problem; we could plot the location of their noisy diesel engines. We found some charted, some not, some operating and others not. Our concern, of course, was about those uncharted and not running. We made frequent periscope observations

to avoid the platforms, which forced us to run faster to maintain the quarry's speed of advance. We continued south at higher speeds for longer periods of time, sometimes with barely 20 to 30 feet of water beneath the Sculpin's keel.

As our target passed between the Great Natuna Islands , we made an end run around North Natuna . After that, our quarry was on a beeline for the Gulf of Thailand , passing through the busy sea-lane between Hong Kong and Singapore . The density of the large shipping traffic in this lane was incredible. Crossing it was like running across a busy freeway. It was night time, and sonar was useless amid all the traffic noise, so we crossed at periscope depth following our quarry's stern light, maneuvering to avoid the large ships bearing down on us from both directions.

The Gulf of Thailand presented a new challenge. The water was hot, 86 degrees Fahrenheit, and shallow, averaging 110 feet deep, and the bottom was flat. The surface was a dead calm mirror with fishing buoys and nets everywhere, not to mention small fishing boats of every description. It was also very hazy and so hot that the horizon was somewhat obscure. Such were the wartime circumstances that our operation order authorized us to operate in water as shallow as six fathoms. Who says nuclear-powered submarines can't operate in the littorals?

**How Invisible?**

During this time we half-jokingly talked about "the hump." We were trying to visualize what the Sculpin looked like on the surface, running at 20 knots, with maybe only 40 feet from the top of the sail to the surface. We visualized a humpâ•"the water displaced above the boat's hullâ•"roaring through the South China Sea like a mini tidal wave, with observers wondering what it was. We assumed the ship left some sort of trail but were certain one would have to be very close to be able to see it.

An incident when I had command duty got my attention. I brought the Sculpin up to periscope depth and saw what I thought was a periscope going by. My first reaction was, "Holy smoke, there's another submarine up here." Then I realized it was a small water-saturated log that was floating vertically. Just for a moment I thought there were two submarines staring at each other and wondered which one was going to blink first. As the trawler moved farther south, she made a distinct turn to the west and then to the northwest. We were absolutely sure she was a gunrunner, going in to land and off-load her ammunition. Then, two things happened. We were ordered by MACV to photograph our target and alerted to prepare to execute a provision in our operation order for us to sink our target with torpedoes.

The photographic mission meant leaving our trail position and speeding up ahead of the target to take pictures as the trawler cruised by. The risk of detection was great because of the flat calm sea and our hump as we repositioned at high speed. To avoid this, we had to go as deep as possible. Commander Mathis selected 90 feet keel depth, leaving 20 feet between the keel and the bottom. We limited periscope exposure to 6 inches for less than ten seconds. We did get good pictures and apparently were not detected, although one photograph revealed three men on deck looking in our general direction. The depth control skill of our diving officer chiefs was extraordinary.

**Where'd She Go?**

Immediately after the trawler made the northwest turn, and just before we communicated with higher authorities, we lost contact for about two hours. Up to that point, our target had been somewhat predictable, cruising on a straight course to the northwest near the center of the Gulf of Thailand about 100 miles off the coast of South Vietnam , with the familiar shaft rub being tracked by sonar. It was night with a full moon, and we saw her lights through the periscope. The horizon was indistinguishable. Suddenly, sonar reported she had stopped, and while the CO watched, the trawler turned off her lights. Blind and deaf, we then lit off the radar and made several sweeps that revealed nothing. This was not too surprising. When a radar hasn't been used in months and is not tuned, taking it out and rotating it a couple of times doesn't guarantee a high probability of picking up a small target. We were not sure whether she had stopped for the night or was moving away in a new direction at slow speed.

We reported the lost contact, which threw the operational command authority in Saigon into a panic. They had been moving South Vietnamese naval forces along the coast to maintain a blocking position based on our updates, so the whole operation threatened to unravel. Commander Mathis and I huddled and decided: "Well, we've got to assume that she's making a run toward the border up there. Let's just go down and run as fast as we can and get about 30 miles ahead of her predicted track and set up a barrier."

So we moved up and waited for her farther up into the Gulf of Thailand . We made that sprint at 20 knots with 20 feet under the keel. At first daylight, we contacted our on station P-3 aircraft and described our quarry, particularly her white color. We requested that the Orion's crew search the area from where we lost contact to the Vietnamese coast. They reported several widely separated contacts; only one of them was white. The CO authorized a low-altitude identification pass, and the P-3 made a positive ID. They reported to Saigon , and we closed the target. As we neared, we regained that familiar shaft rub and when we took another periscope look, it was herâ•"positive identification, both sonar and visual.

Originally, MACV requested authorization for us to sink the target with our torpedoes, but this was not approved. For years I assumed that the National Command Authority in Washington , D.C. , disapproved the request. However, several years later, Harry Mathis, who by then was a captain, was commanding officer of the Submarine Base Pearl Harbor. He regularly played tennis with retired Admiral Bernard "Chick" Clarey, who had been commander-in-chief Pacific Fleet at the time of our operation. Admiral Clarey remembered the operation very well because he and Admiral John McCain, commander-in-chief Pacific, had followed our progress closely in daily briefings. Admiral Clarey told Mathis that he had argued vehemently in favor of having us shoot, but Admiral McCain was not convinced it would work. Instead, South Vietnamese naval forces were called in to do the job on 24 April.

**High-Seas Drama**

The surface forces led by a South Vietnamese destroyer escort challenged the trawler, which hoisted a Chinese flag and an international flag signal designating they were fishing. The South Vietnamese commander was hesitant to take action because he was concerned about creating an international incident. Fortunately, we established communications with the U.S. liaison officer on board the destroyer with the UQC underwater telephone. His first question was whether we could verify this ship as our trawler. We told him, "Absolutely, this is the one without a doubt." We then went to periscope depth to observe.

The trawler tried to convince the South Vietnamese destroyer that she was an innocent fishing vessel. We spoke once again with the liaison officer and with higher authorities and said: "We are absolutely sure that this ship came out of Hainan flying a PRC [People's Republic of China ] flag. We have tracked her 2,500 miles to this position, and in our opinion she is a gunrunner making a run toward the border and certainly is not a fisherman. We can verify who she is, which should allow us to take whatever action is appropriate."

As we later learned from the intercepted communication, the trawler at one point said, "I think there is a submarine out there." This was the first indication that the trawler crew was aware of us as we coordinated with the destroyer. Based on our identification, the destroyer escort ordered the trawler to stop, and when she failed to comply, began making intimidating runs at her, finally opening fire from a standoff position with her 3-inch guns. The trawler was hit and began burning, running in a circle as if the rudder was jammed hard over. We watched through the periscope, and our crew gathered in their mess to watch on the TV monitor. Suddenly, with a thunderous roar, clearly audible through the Sculpin's hull, the trawler exploded and disintegrated as its cargo detonated. Flames leaped hundreds of feet in the air, accompanied by the cheers of our crew.

At this moment, Commander Mathis asked the crew over the 1MC for a moment of silence. Enemy or not, they had perished doing their mission. Later, we were pleased to learn that 16 of the trawler crew had been rescued and they spoke Vietnamese, not Chinese. The captain and the navigator were among them and able to provide valuable intelligence about their operations. One of the few casualties was the political officer. Our communication with command headquarters, through the loitering Orion during the urgent final search, was vital. Only later did we learn that, because of atmospheric conditions, the communications link with Saigon consisted of the P-3 aircraft on station relaying to another P-3 revving up its engines on the ground at its airbase while parked next to a phone booth. A flight crew member would run out to the phone and relay the messages between Saigon and us.

One other significant factor made the mission possible. It could only have been done by a nuclear-powered submarine. That experience gave me great admiration for the diesel-boat crews and skippers of World War II. We had more margin for error than they did because of their speed limitations owing to low battery capacity. If we made a mistake on the Sculpin, we could make it up through speed and repositioning, which couldn't be done with a diesel boat. Certainly our speed came in handy, not only in the basic trail, trying to stay up with a ship doing 11 knots and do all the things we had to do, but also during that period when we lost them. We were able to run quickly forward, reposition up the track, and get a chance to pick them up again. But that blackout period was a low point. We had trailed the ship 2,300 miles and thought we'd lost her.

**Hidden Valor**

The trawler's crew verified that their ship was a gunrunner. They had on board enough arms and ammunition to supply the Vietcong in IV Corps for at least 60 days. Her destruction thus made a significant contribution to the safety of U.S. and South Vietnamese troops in the area and set back the enemy's military operations there. The surviving crew were North Vietnamese. They were split up, with U.S. and South Vietnamese intelligence each interrogating half and their stories compared. It was determined that the navigator's responses were credible because he provided interrogators with exactly the same track we plotted.

The United States learned much about the North Vietnamese at-sea resupply strategy. It also learned that the trawler crews were not elite forces that would resist until death. One engineer told of being at his station when the political officer came to the engine room hatch, told him the enemy had arrived, and ordered him to stay at his post. The engineer, no doubt considering the nature of the cargo, said, "I immediately went on deck and jumped into the water."

It was an unusual operation. We spent more time submerged inside the 100-fathom curve than any U.S. submarine since World War II. Crew training, equipment reliability, ship control, navigation, sonar, communications, propulsion plant everything and everyone performed superbly. We could not have asked for anything more.

For that operation the Sculpin earned the Vietnamese Cross of Gallantry, the only U.S. submarine during the entire Vietnam War to receive that award. The Sculpin was also nominated for the submarine combat patrol pin, and our individual awards for the combat "V." If that had been approved, she would have been the first submarine since World War II to get the combat patrol pin [This statement is incorrect! The USS Perch (SS-313) and the USS Pickerel (SS-524) were awarded the combat patrol pin in 1950 during the Korean Conflict. *Mike Hyman. Sentinel Editor*]. Instead, the nomination was disapproved somewhere up the chain of command. I assume it was probably rejected by a World War II submariner who thought the operation wasn't nearly as hazardous as what he did during his war, and it didn't measure up. I can't argue with that, but the crew had great hope that they could proudly wear the pin for their contribution, particularly to the safety of our troops. Another consideration, however, might have been that those pins would have raised questions and possibly compromised an operation that was still classified.

We covered a huge distance in trail during that operation. Someone asked me later how I slept at night. I said, "With a pillow under my head, up against the bulkhead in case we hit something."

Admiral Larson went on to serve on active duty for 40 years. His senior position was as commander-in-chief of all United States military forces in the Pacific. Captain Wright served 26 years on active duty. He was commanding officer of USS Puffer (SSN-652) and operations officer for Commander Submarine Group Seven. Mr. Stillwell, the former editor of Naval History and the U.S. Naval Institute Oral History Program, has written the "Looking Back" column since 1993.

**Cold War Records**

This article is the result of merging my notes and recollections with those of Clint Wright, who stood a good many watches as Sculpin's officer of the deck during the pursuit of the trawler. Clint also gained access to the unclassified versions of the submarine's deck logs. Other OODs during the operation included Lieutenants Dick Snaider, Jim Gabala, Alan Beam, and Charlie Krupnick.

Getting our joint account through security review was an interesting challenge. Clint's original motive was to publish an article, because he wanted the Sculpin Sailors to get credit for what they did. My motive was to try and get it cleared for my oral history, so at least part of our special operations could be made public to my family and to other interested people. We jointly pursued this effort, dealing with the director of Naval Intelligence and several people who used to work for me. The first thing we discovered was that there were absolutely no records of the Sculpin's operations. They had all been destroyed.

This highlights weaknesses in the Naval Intelligence Command's record keeping. As far as we can determine, the Navy had its standard Cold War intelligence gathering, what we called "special operations," which were classified and compartmentalized. Those reports appear to have been preserved. But because the Sculpin's Vietnam operation was not in that category it was a more conventional, although extremely unusual, operation and didn't have the protection of that system the reports were purged at some point when the government discarded old records. There is just no official record of this operation.

In putting this story together and sending it forward for clearance by the Navy Department, I think we did a double service. We not only got it cleared so those who served in the Sculpin during this time can receive credit, but we made this operation public and prevented it from being lost forever. At some point, an old Sculpin Sailor would have wanted to talk about it, and there would have been no way to find the records. So I'm very pleased that we were able to do that for our fine crew.

***Admiral Charles R. Larson***

# Digitizing Our U.S. Submarine WWII War Patrol Reports

**Forward:**

**"This effort by EMC (SS) John Clear USN (Ret) is truly remarkable. For over 40 years, although declassified, the remarkable exploits of the U. S. Submarine Force during WWII sat on microfilm in a few museums and files, essentially untouched. His initiative revealed factual accounts of each U. S. submarine war patrol during WWII. In my view, that delay in publication was a travesty which should not have occurred for our WWII submarine veterans.**

**The Cold War is over. It should not take four decades before the importance of U. S. Submarine efforts during that period are made public."**

**Very Respectfully, VADM Roger F. Bacon, USN (Ret)**

**Digitizing Our U.S. Submarine WWII War Patrol Reports**

**I first became acquainted with the WWII U.S. Submarine War Patrol Reports microfilm collection at the Naval Undersea Museum, Keyport, WA in the summer of 2006, while volunteering as a docent at the museum. This little known and very infrequently used collection is housed within the 3rd floor, non-lending library of this outstanding facility which is one of only a small hand full in our nation where these reports can be viewed.**

**Being a retired SubLant and SubPac Chief, whose naval career had included tours of duty on three of these WWII veteran submarines, I was interested in their war time history and achievements. With help from the museum's staff (in particular Jennifer Heinzelman, Collections Manager), I soon became well versed with the library's microfilm reader as to how to set-up and peruse the film rolls of the 255 U.S. submarine's war patrol records. These numerous microfilm rolls are housed in large collection drawers there within the library.**

**What immediately struck me in reading these histories from the microfilm copies of the original paper reports was the succinct manner in which these histories had been recorded at the time of and where these events occurred. Some of these reports were almost "casual" in their presentation of these awesome events. As an example: one of my previous tours of duty was on the USS Sealion SS-315 which just happened to be the only submarine in history to sink an enemy battleship in wartime. To read the pertinent pages from within this particular report of this patrol one would think that this type of occurrence was rather commonplace and not of such monumental importance as it had been. Well known submarines and individual heroes of these times seem to be "alive" in their patrol report depictions. The officers making the input and the yeomen that typed up these multi-copy reports on their old Underwood typewriters did so with an almost clinical detachment, ultimately providing an insight as no other form of written historical log or book has given us.**

**Again with the aid of the staff I was able to print out some of these pages but it was a very slow and cumbersome chore. It wasn't until I was able to reconnect the microfilm reader's output directly to a computer and hence save pages in a digital format that this effort began to come together and make sense. From my research I had found that nearly half of these microfilmed reports were photographed in l6mm and the rest in 35mm, in that, again, I found another problem. The 16 mm pages were an easy and direct "save to" on the p.c., but the 35mm had to be worked on with an average of three shots and then laboriously "stitched" together with the computers software. To say that this slowed down the procedure is an understatement. Fast calculations showed that I had about 5 years of 8 hour days ahead of me at the rate that I was preceding.**

**By the fall of the year I had been hooked on this project. One day while talking with an active duty LCDR and Jennifer, I decided that this project had to be taken on in earnest in order to more easily share these historic times with the many rather than just the few that had access to these microfilm libraries. I wanted to get these stories out while we still had some of our WWII submarine veterans with us, whose stories were told within these pages.**

**Further research found that recent technology had been developed that could now take on this conversion in a manner that would not require the manual, laborious efforts thus far expended. This newer technology was basically a huge machine that could read and convert these microfilm rolls faster than I ever could hope to accomplish. Two major companies were queried as to cost. The pricing, while fair (quoted at over six thousand dollars), was not something that the museum, nor its supporting foundation, would be able to fund. With the help of a long time friend, Dan Martini EMCM (SS), USN Ret., a partnership was formed and registered in Jefferson County of Washington State**

**with the express purpose of handling this project. The museum agreed to lend out the microfilm rolls (some 255) to the company that we had agreed upon and the partnership would pay the cost of the conversion process.**

**It was at about this time that Vice Admiral Roger Bacon, of the museums foundation, had heard of our project and wanted to help make the project move into reality. Admiral Bacon's father had been a highly respected WWII submarine Commanding Officer and thus Admiral Bacon's interest in these reports had been in mind for many years.**

**The initial run received from the conversion company came down to 28 full DVDs containing all of the 1,600+ war patrol reports of the 255 submarines involved. We were provided with two master copies, one in .jpg (picture) format and the other in .pdf (Adobe Reader) format. These reports were assembled in hull number sequence, oldest to the newest of the participating WWII subs. As per SubPacs instructions, the vast majority of the war patrol reports were written within the require guidelines as follows;**

**(A) Prologue**
**(B) Narrative (date & time)**
**(C) Weather**
**(D) Tidal information**
**(E) Navigational aids**
**(F) Ship Contacts**
**(G) Aircraft**
**(H) Attacks**
**(I) Mines**
**(J) Anti-submarine measures and evasive tactics**
**(K) Major defects**
**(L) Radio**
**(M) Radar**
**(N) Sound gear & conditions**
**(O) Density Layers**
**(P) Health, food & habitability**
**(Q) Personnel**
**(R) Miles steamed, fuel used**
**(S) Duration**
**(T) Factors of endurance remaining**
**(U) Communication, radar and sonar countermeasures**
**(V) Remarks**

**It was also at this point that we registered our newly converted war patrol reports and were issued an ISBN number of 13: 978-0-615-17769-4. together with an intellectual copyright being filed (to protect the digital conversion).**

**By early 2007 we had the final masters on hand and began further production from these sets. Admiral Bacon (as our mentor) financed the first (costly) five sets and donated these to the Newport, RI and Monterey, CA Naval War College libraries, the St. Mary's, Georgia Museum, USS Nautilus Museum, Groton, CN and the USS Bowfin Museum, Honolulu, HI. The partnership in turn provided a master set to the Naval Undersea Museum and to some eight submarines stationed at Bangor Submarine Base, WA during our quarterly NSL NW meetings.**

**Later that year, during the 2007 USSVI Alaskan Cruise Convention, these patrol reports were first introduced, in their new user friendly digital format to the submarine community at large. We also posted this information on the internet at the same time. It was the partnership's agreement, to provide at no cost, any copy of any submarine reports to any WWII sub vet or his immediate family, several hundred individual boat's patrol reports were thus sent out. Many submarine authors, (Tom Clancy, et al), researchers, and historians were among the initial purchasers.**

**By 2009 it was decided to make these reports available for free viewing to the general public directly on the internet. Rich Pekelney of the Historic Naval Ships Association, (HNSA), was contacted and uploaded all of the reports onto their website with a bravo zulu sent back to the partnership and our mentor Admiral Bacon. While able to view the reports for free via the internet, these pages are not easily copied or printed out.**

**In quick order further improvements in computer software allowed the reports to be further converted to a "compressed pdf'" format greatly reducing the production time and lowering the overall cost to less then 1/10 of the initial offering. The total of the reports including all of the appendices (which include some fifteen cross references, by boat, C.O. etc.) are now on just 4 DVD's in this compressed .pdf format.**

**We have archived the initial run in the .jpeg format to allow for further "cleaning up" (in time) of some of the reports that were either too light, dark, smudged or had any other problems in their reading quality.**

**The outcome of this effort has provided an easy to use reference of the thousands of pages that if printed out on single sided paper, would be a book at over 22 feet across, a massive work!**

**The company, (now a corporation), has continued to provide these reports at an extremely low cost to a world wide audience. Our initial desire to acknowledge our WWII Submarine Veterans still alive has been well met and we will continue in our stated efforts through Submarine Memorabilia, Inc...**

**John Clear EMC(SS) USN Ret.**
**Submarine Memorabilia, Inc.**
**180 Robin Lane**
**Port Ludlow, WA 98365-9522**
**webmaster@usssealion.com**

# Listing of all U.S. Submarines in WWII (Pacific) by Name (alpha), Hull Number (i.e. SS-218), Number of Patrols Made & Total Pages Within War Patrol Reports.

| Albacore | 218 | 10 | 551 |
|---|---|---|---|
| Amberjack | 219 | 3 | 82 |
| Angler | 240 | 7 | 338 |
| Apogon | 308 | 8 | 253 |
| Archerfish | 311 | 7 | 223 |
| Argonaut | 166 | 2 | 82 |
| Argonaut | 475 | 1 | 78 |
| Aspro | 309 | 7 | 286 |
| Atule | 403 | 4 | 190 |
| Balao | 285 | 10 | 410 |
| Bang | 385 | 6 | 235 |
| Barb | 220 | 12 | 503 |
| Barbel | 316 | 4 | 139 |
| Barbero | 317 | 2 | 100 |
| Barracuda | 163 | 6 | 36 |
| Bashaw | 241 | 6 | 312 |
| Bass | 164 | 4 | 47 |
| Batfish | 310 | 6 | 331 |
| Baya | 318 | 5 | 229 |
| Becuna | 319 | 5 | 200 |
| Bergall | 320 | 5 | 175 |
| Besugo | 321 | 5 | 268 |
| Billfish | 286 | 8 | 285 |
| Blackfin | 322 | 5 | 60 |
| Blackfish | 221 | 12 | 432 |
| Blenny | 324 | 4 | 495 |
| Blower | 325 | 3 | 123 |
| Blueback | 326 | 3 | 267 |
| Bluefish | 222 | 9 | 402 |
| Bluegill | 242 | 6 | 389 |
| Boarfish | 327 | 4 | 154 |
| Bonefish | 223 | 8 | 508 |
| Bonita | 165 | 7 | 43 |
| Bowfin | 287 | 9 | 524 |
| Bream | 243 | 6 | 365 |
| Brill | 330 | 3 | 89 |
| Bugara | 331 | 3 | 62 |
| Bullhead | 332 | 3 | 75 |
| Bumper | 333 | 2 | 82 |
| Burrfish | 312 | 6 | 297 |
| Cabezon | 334 | 1 | 36 |
| Cabrilla | 288 | 8 | 368 |
| Cachalot | 170 | 3 | 52 |
| Caiman | 323 | 4 | 117 |
| Capelin | 289 | 1 | 64 |
| Capitaine | 336 | 1 | 61 |
| Carbonero | 337 | 2 | 50 |
| Carp | 338 | 1 | 56 |
| Catfish | 339 | 1 | 38 |
| Cavalla | 244 | 6 | 323 |
| Cero | 225 | 8 | 485 |
| Charr | 328 | 3 | 114 |
| Chub | 329 | 3 | 138 |
| Cobia | 245 | 6 | 269 |
| Cod | 224 | 7 | 466 |
| Crevalle | 291 | 7 | 506 |
| Croaker | 246 | 6 | 266 |
| Cutlass | 478 | 1 | 21 |
| Cuttlefish | 171 | 3 | 92 |
| Dace | 247 | 7 | 691 |
| Darter | 227 | 4 | 290 |
| Dentuda | 335 | 1 | 47 |
| Devilfish | 292 | 4 | 97 |
| Diablo | 479 | 2 | 17 |
| Dolphin | 169 | 3 | 61 |
| Dragonet | 293 | 3 | 117 |
| Drum | 228 | 13 | 350 |
| Entemedor | 340 | 1 | 26 |
| Finback | 230 | 12 | 417 |
| Flasher | 249 | 6 | 265 |
| Flier | 250 | 2 | 130 |
| Flounder | 251 | 6 | 278 |
| Flyingfish | 229 | 12 | 555 |
| Gabilan | 252 | 6 | 225 |
| Gar | 206 | 15 | 347 |
| Gato | 212 | 13 | 552 |
| Golet | 361 | 2 | 27 |
| Grampus | 207 | 6 | 243 |
| Grayback | 208 | 10 | 477 |
| Grayling | 209 | 8 | 143 |
| Greenling | 213 | 12 | 427 |
| Grenadier | 210 | 6 | 199 |
| Grouper | 214 | 12 | 311 |
| Growler | 215 | 11 | 404 |
| Grunion | 216 | 1 | 30 |
| Guardfish | 217 | 12 | 590 |
| Guavina | 362 | 6 | 242 |
| Gudgeon | 211 | 12 | 566 |
| Guitarro | 363 | 5 | 300 |
| Gunnel | 253 | 8 | 352 |
| Gurnard | 254 | 9 | 489 |
| Hackleback | 295 | 2 | 95 |
| Haddo | 255 | 10 | 384 |
| Haddock | 231 | 13 | 334 |
| Hake | 256 | 9 | 320 |
| Halibut | 232 | 10 | 357 |
| Hammerhead | 364 | 7 | 283 |
| Harder | 257 | 6 | 325 |
| Hardhead | 365 | 6 | 314 |
| Hawkbill | 366 | 5 | 250 |
| Herring | 233 | 7 | 156 |
| Hoe | 258 | 8 | 320 |
| Icefish | 367 | 5 | 177 |
| Jack | 259 | 9 | 304 |
| Jallao | 368 | 4 | 127 |
| Kete | 369 | 2 | 36 |
| Kingfish | 234 | 12 | 522 |
| Kraken | 370 | 4 | 144 |
| Lagarto | 371 | 2 | 43 |
| Lamprey | 372 | 3 | 85 |
| Lapon | 260 | 8 | 325 |
| Lionfish | 298 | 2 | 74 |
| Lizardfish | 373 | 2 | 101 |
| Loggerhead | 374 | 2 | 59 |
| Macabi | 375 | 1 | 32 |
| Manta | 299 | 1 | 37 |
| Mingo | 261 | 7 | 257 |
| Moray | 300 | 1 | 29 |
| Muskellunge | 262 | 7 | 250 |
| Narwhal | 167 | 16 | 357 |
| Nautilus | 168 | 15 | 452 |
| Paddle | 263 | 8 | 381 |
| Pampanito | 383 | 6 | 240 |
| Parche | 384 | 6 | 274 |
| Pargo | 264 | 8 | 482 |
| Perch | 176 | 2 | 349 |
| Permit | 178 | 14 | 598 |
| Peto | 265 | 10 | 380 |
| Pickerel | 177 | 7 | 254 |
| Picuda | 382 | 6 | 291 |
| Pike | 173 | 8 | 219 |
| Pilotfish | 386 | 6 | 203 |
| Pintado | 387 | 6 | 236 |
| Pipefish | 388 | 6 | 248 |
| Piper | 409 | 3 | 111 |
| Piranha | 389 | 5 | 227 |
| Plaice | 390 | 6 | 354 |
| Plunger | 179 | 12 | 357 |
| Pogy | 266 | 10 | 334 |
| Pollack | 180 | 11 | 372 |
| Pomfret | 391 | 6 | 359 |
| Pompano | 181 | 7 | 182 |
| Pompon | 267 | 9 | 227 |
| Porpoise | 172 | 6 | 213 |
| Puffer | 268 | 9 | 483 |
| Queenfish | 393 | 5 | 248 |
| Quillback | 424 | 1 | 63 |
| Rasher | 269 | 8 | 543 |
| Raton | 270 | 8 | 317 |
| Ray | 271 | 8 | 399 |
| Razorback | 394 | 5 | 275 |
| Redfin | 272 | 7 | 290 |
| Redfish | 395 | 2 | 201 |
| Robalo | 273 | 3 | 143 |
| Rock | 274 | 6 | 67 |
| Ronquil | 396 | 5 | 251 |
| Runner | 275 | 3 | 94 |
| Runner | 476 | 1 | ?? |
| S-11 | 116 | 6 | 40 |
| S-13 | 118 | 4 | 36 |
| S-15 | 120 | 3 | 25 |
| S-17 | 122 | 6 | 63 |
| S-18 | 123 | 7 | 72 |
| S-23 | 128 | 7 | 61 |
| S-26 | 131 | 2 | 120 |
| S-27 | 132 | 1 | 107 |
| S-28 | 133 | 7 | 451 |
| S-30 | 135 | 9 | 152 |
| S-31 | 136 | 8 | 152 |
| S-32 | 137 | 8 | 120 |
| S-33 | 138 | 8 | 128 |
| S-34 | 139 | 7 | 92 |
| S-35 | 140 | 8 | 143 |
| S-36 | 141 | 2 | 87 |
| S-37 | 142 | 7 | 173 |
| S-38 | 143 | 9 | 40 |
| S-39 | 144 | 5 | 117 |
| S-40 | 145 | 9 | 146 |
| S-41 | 146 | 8 | 160 |
| S-43 | 154 | 3 | 107 |
| S-44 | 155 | 4 | 99 |
| S-45 | 156 | 4 | 95 |
| S-46 | 157 | 5 | 133 |
| S-47 | 158 | 7 | 186 |
| Sailfish | 192 | 12 | 366 |
| Salmon | 182 | 11 | 431 |
| Sand Lance | 381 | 5 | 168 |
| Sargo | 188 | 12 | 447 |
| Saury | 189 | 11 | 431 |
| Sawfish | 276 | 10 | 364 |
| Scabbardfish | 397 | 5 | 223 |
| Scamp | 277 | 8 | 229 |
| Scorpion | 278 | 4 | 102 |
| Sculpin | 191 | 9 | 285 |
| Sea Cat | 399 | 4 | 155 |
| Sea Devil | 400 | 4 | 228 |
| Sea Dog | 401 | 4 | 199 |
| Sea Fox | 402 | 4 | 148 |
| Sea Owl | 405 | 3 | 184 |
| Sea Poacher | 406 | 4 | 193 |
| Sea Robin | 407 | 3 | 177 |
| Sea Wolf | 197 | 15 | 590 |
| Seadragon | 194 | 12 | 468 |
| Seahorse | 304 | 8 | 439 |
| Seal | 183 | 12 | 557 |
| Sealion | 315 | 6 | 330 |
| Searaven | 196 | 13 | 594 |
| Segundo | 398 | 5 | 236 |
| Sennet | 408 | 4 | 146 |
| Shad | 235 | 11 | 362 |
| Shark | 174 | 3 | 201 |
| Shark | 314 | ? | ??? |
| Silversides | 236 | 14 | 467 |
| Skate | 305 | 7 | 108 |
| Skipjack | 184 | 10 | 391 |
| Snapper | 185 | 11 | 371 |
| Snook | 279 | 9 | 334 |
| Spadefish | 411 | 5 | 308 |
| Spearfish | 190 | 12 | 495 |
| Spikefish | 404 | 4 | 113 |
| Spot | 413 | 3 | 189 |
| Springer | 414 | 3 | 86 |
| Steelhead | 280 | 7 | 308 |
| Sterlet | 392 | 5 | 237 |
| Stickleback | 415 | 1 | 33 |
| Stingray | 186 | 16 | 470 |
| Sturgeon | 187 | 11 | 315 |
| Sunfish | 281 | 11 | 459 |
| Swordfish | 193 | 13 | 422 |
| Tambor | 198 | 12 | 461 |
| Tang | 306 | 5 | 206 |
| Tarpon | 175 | 12 | 393 |
| Tautog | 199 | 13 | 653 |
| Tench | 417 | 3 | 125 |
| Thornback | 418 | 1 | 76 |
| Threadfin | 410 | 3 | 146 |
| Thresher | 200 | 15 | 120 |
| Tigrone | 419 | 3 | 200 |
| Tilefish | 307 | 6 | 257 |
| Tinosa | 283 | 11 | 521 |
| Tirante | 420 | 2 | 131 |
| Toro | 422 | 2 | 51 |
| Torsk | 423 | 2 | 70 |
| Trepang | 412 | 5 | 326 |
| Trigger | 237 | 12 | 381 |
| Triton | 201 | 6 | 205 |
| Trout | 202 | 11 | 289 |
| Trutta | 421 | 2 | 154 |
| Tullibee | 284 | 4 | 125 |
| Tuna | 203 | 13 | 497 |
| Tunny | 282 | 9 | 472 |
| Wahoo | 238 | 7 | 165 |
| Whale | 239 | 8 | 427 |