



**The Monthly Newsletter,
Perch Base, USSVI
Phoenix, Arizona**

**October 2011
Volume 17 - Issue 10**

**Featured
Story**

WWW.PERCH-BASE.ORG

Torpedoes in World War II

The Mark 14 Troubles and Solutions

EXCLUSIVE! WWII Veteran Torpedoman Billy Grieves relates personal experience

What Else is "Below Decks" in the MidWatch

<u>Article</u>	Page Number
Title and "What's Below Decks".	1
Less We Forget - Boats on Eternal Patrol	2
USSVI Creed - Our Purpose	5
Perch Base Foundation Supporters	5
Perch Base Officers	6
Sailing Orders (<i>What's happening with the Base</i>)	6
From the Wardroom - Base Commander's Message	7
Meeting Minutes - (NOT AVAILABLE)	7
Classifieds: Items for Sale by Shipmates.	8
This Ain't No Sh*t	9
"That's Odd #1".	9
Special Gift Card Promo	10
"That's Odd #2"	10
Lost Boat - USS Tang (SS-306)	11
Need a Ride?.....	14
Chaplain's Column (<i>Letter from National</i>)	15
Photos: Service for Jack Kimball	16
A Message from the Membership Chairman	17
Communication Officer's Report	17
October Base Birthdays	18
Binnacle List	18
Article: Canada is "Skimmers Only" for a While	19
"That's Odd #3"	20
Coming Soon - New Mugs!	21
Feature: Torpedo Development During WWII	22
EXTRA: Billy Grieve's personal account	24
Mailing Page	30

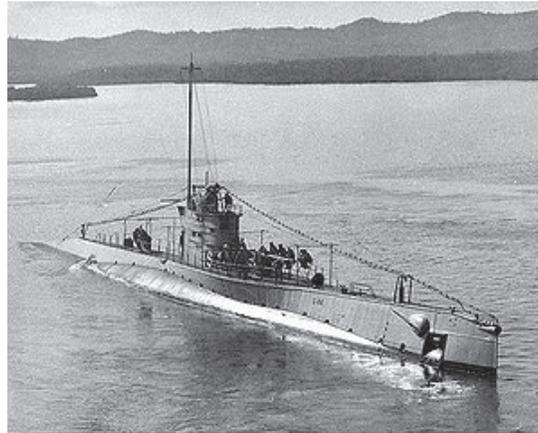
**PERCH BASE SUPPORTS THE USSVI CREED.
SEE PAGE FIVE FOR THE FULL TEXT OF OUR CREED.**

LEST WE FORGET THOSE STILL ON PATROL

OCTOBER ETERNAL PATROLS



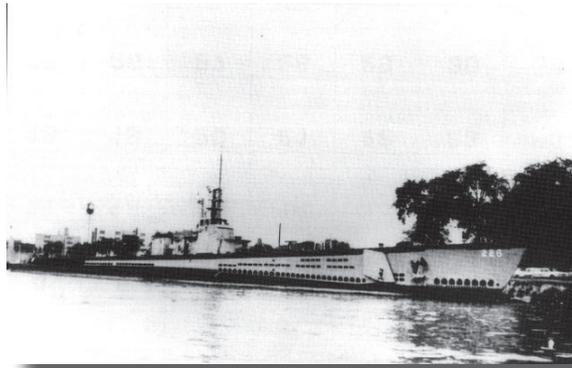
USS O5 (SS-66) 20 Oct 1923 3 Lost
Rammed by freighter in Limon Bay, Canal Zone



USS S44 (SS-155) 07 Oct 1943 55 Lost
Japanese surface attack in Sea of Okhotsk



USS WAHOO (SS-238) 11 Oct 1943 80 Lost
Japanese air/surface attack in La Perouse Strait off Japan



USS DORADO (SS-248) 12 Oct 1943 76 Lost
“Friendly-fire” air attack in S.W. Atlantic



USS ESCOLAR (SS-294) 17 Oct 1944 82 Lost
Possible Japanese mine in Yellow Sea off China



USS SHARK (SS-314) 24 Oct 1944 87 Lost
Japanese depth charge attack off Formosa



USS TANG (SS-306) 24 Oct 1944 78 Lost
Circular run of own Torpedo in Formosa Strait



USS SEAWOLF (SS-197) 30 Oct 1944 99 Lost
Possible “friendly-fire” from aircraft off Morotai Island

Lost Harbor

by Leslie Nelson Jennings

**There is a port of no return, where ships
May ride at anchor for a little space
And then, some starless night, the cable slips,
Leaving an eddy at the mooring place . . .
Gulls, veer no longer. Sailor, rest your oar.
No tangled wreckage will be washed ashore.**

USSVI CREED

Our organization's purpose is . . .

“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.”



2011 Perch Base Foundation Supporters

These are the Base members and friends who donate monies to allow for Base operation while keeping our dues low and avoid raising money through member labor as most other organizations do.

Remember, if you contribute by check, it must be made out to the “Perch Base Foundation.”

These are the 2011 Foundation Donors



BEN ACOSTA
JERRY N. ALLSTON
KENNETH R. ANDERSON
STEVEN BALTHAZOR
GARY BARTLETT
JEROME F. BECKER
KENNETH E. BECKER
RICHARD BERNIER
RONALD B. BEYER
DAVID CARPENTER
JOHN CASH
ROGER J. COUSIN
EUGENE V. CRABB
GEORGE L. CRIDER
MICHAEL DAHL
BILLY DeSHONG
JAMES N. EDWARDS
HARRY ELLIS
JOE ERRANTE
JAMES EVANS
THOMAS E. FOOSHEE
JOHN A. GRAVES
BILLY A. GRIEVES
MICHAEL J. HALER
EDWARD J. HAWKINS
HARRY HELLER
GLENN A. HEROLD
LESTER R. HILLMAN
THEODORE HUNT
DAVY L. JONES

L. A. (MIKE) KEATING
JACK S. KIMBALL
RICHARD F. KUNZE
DEWIGHT KRAMER, SR.
DOUGLAS M. LA ROCK
DARRELL LAMBERT
ROBERT A. LANCENDORFER
ALBERT LANDECK
DeWAYNE LOBER
BURTIS W. LOFTIN
STEPHEN A. MARCELLINO
GEORGE MARIONS
RAYMOND MARSHALL
SANDY MARTIN
TERRY MARTIN
ROBERT E. MAY
DENNIS McCOMB
ANGUS HOWARD McPHERSON
ALLEN H. MILLER
ROGER M. MILLER
TIM MOORE
DANNY R. MOSS
JEFF A. NELSON
JIM A. NELSON
JAMES F. NEWMAN
JAMES W. NEWMAN
ROYCE E. PETTIT
ERNIE PLANTZ
LARRY M. RANKIN
DANIEL J. REEL

STAN REINHOLD
BRUCE “ROBIE” ROBINSON
PETE SATTIG
FRED SAUNDERS
EMIL SCHOONEJANS
GARRY L. SHUMANN
RICK SIMMONS
WAYNE KIRK SMITH
ADRIAN M. STUKE
DONALD UNSER
ROBERT WARNER
JAMES WALL
FORREST J. WATSON
ED WOLF
JOHN G. ZAICHKIN
RONALD J. ZOMOK

PERCH BASE OFFICERS



BASE COMMANDER
Jim Denzien
(623) 547-7945
commander@perch-base.org

BASE VICE-COMMANDER
Howard Doyle
(623) 935-3830

vice-commander@perch-base.org



SECRETARY
John Schlag
(623) 872-8224
secretary@perch-base.org

TREASURER
Bob Warner
(623) 825-7042

treasurer@perch-base.org



MEMBERSHIP
Rick Simmons
(623) 583-4235
membership@perch-base.org

CHIEF OF THE BOAT
Rich Kunze
(623) 932-3068
cob@perch-base.org



COMMUNICATIONS OFFICER
Chuck Emmett
(623) 466-9569
communications@perch-base.org

STOREKEEPER
De Wayne Lober
(602) 944-4200

storekeeper@perch-base.org



CHAPLAIN
Walt Blomgren
(602) 309-4407
chaplain@perch-base.org

EVENT COORDINATOR
Joe "Wanderer" Varese
(623) 388-6749
events@perch-base.org



HISTORIAN
Jim Newman
(602) 840-7788
historian@perch-base.org

PAST-COMMANDER
Stan Reinhold

past-commander@perch-base.org



Sailing Orders



NEXT REGULAR MEETING
12 noon, Saturday, October 8, 2011
(social hour at 11 a.m.)
Dillon's Restaurant at Arrowhead
20585 N. 59th Avenue
Glendale, AZ 85308-6821

All of the following events will be updated and details verified by **Flash Traffic** messages.

October 6
Glendale Safety Days (parade and static display)

October 28
ASU Homecoming (with ASU NROTC Unit)

November 5
Tempe Veteran's History Project

November 9 & 10
Higley HS and Gilbert, AZ, Veterans Event (static displays)

November 11
Phoenix Veteran's Day Parade

November 14
Anthem (followed by) Black Canyon City Veteran's Parades.

**From the Wardroom
Base Commander's Message**

Shipmates:

Float maintenance was scheduled and conducted on September 17, 2011 at our storage area. The folks at the storage area were most gracious and allowed us to use a covered space in which to paint the float. We will wait and install the new graphics the week of 19 September. The new paint looks great! It is amazing how much black paint can fade in three years. We had a great turnout of shipmates which was most appreciated.

Last month's guest speakers were well received and their presentation was very interesting. Thank you ladies!

We are rapidly approaching the hectic and busy time of year with respect to float use, both for parades and static displays. More information on those activities will be in the schedule on our website. Check it! There is great information there!

See you all at the meeting in October: the 8th.

Fraternally,

Jim Denzien, Base Commander

**September 2011
Minutes of the Regular Base Meeting**

At the regular, schedule time this newsletter went to press, the Minutes of the September Base meeting had not been received.

CLASSIFIED

ITEMS FOR SALE BY SHIPMATES

SHIPS PLAQUES FOR SALE. I have the following ships plaques (TECUMSEH, HENRY CLAY, SUBRON 15, BEN FRANKLIN, TIRU, SALMON, DANIEL BOONE, RONQUIL) that will be sold for \$25 each. All proceeds to be donated to the Dolphin Scholarship Fund. They will be available at the next meeting OR I will accept orders prior to the meeting.
Dan Moss





**SHIPMATE TO SHIPMATE
STORIES THAT ARE
“ABSOLUTELY, POSITIVELY, THE TRUTH!”**

It was the late 60's and the USS Tullibee SSN597 was assigned to do an ASW op with a diesel boat off the east coast between the mainland and Bermuda. Tullibee headed for Bermuda a few days early to give us a chance for some rare “foreign” port liberty and also some warm water to christen all the newly qualified and/or promoted crewmembers, you know the drill.

As usual there was no shore power available so all the nukes went into “Tullibee Power & Light” mode which was port and starboard watch section, one day on, one day off. As luck would have it a hurricane was cranking up around the Virgin Islands and veered north as we made port. The track was to take it right up along the eastern seaboard right through our scheduled operating area so the op was postponed so the diesel boat could stay in port until the storm passed. This meant we HAD to stay in Bermuda until the storm passed, so a 2 day port call turned into a week. The only downside was that we had to be ready to get underway each day until we got the word, usually about 13:00, from SUBLANT that the op was not going to happen that day. So for a week we pretty much had the good life, the beach, tours in town, the bars, etc.

One night I'm standing upper level watch, remember us nukes are still running the engineering plant just not the propulsion part. As I'm shooting the shit with the EOOW I keep hearing the hydraulic pumps cycle. At first it didn't register that we weren't supposed to be using the hydraulics for anything in port. After looking for leaks in the engineering spaces we called the below decks watch to see if he knew what was up. All he said was “look up the after hatch”. I climbed up and found the “problem”.

It seems that the Captain had returned from an evening on indulging at the local O-Club and returned with most of a case of beer. Knowing he couldn't bring it on the boat he was sitting on a bollard finishing it off. Anyone else returning to the boat was recruited to help him finish it. As he was sitting there on that balmy night he thought it would be fun to take a dip so he climbed up on the fairwater planes and dove in. He thought that was great and being, at least in his mind, a jock he started challenging everyone else drinking with him to dive in as well. As the game progressed more and more challenging dives were made. After someone does a flip off the planes the old man feels he's losing his own challenge, that's when it hits him, the fairing on the top of the ECM mast was pretty flat and he had the bright idea to dive from it. He climbs up and calls down to the below decks watch to “raise the ECM” and dives off. Now it's on and everyone is challenged to dive from the raised ECM mast. Up and down it's going, getting more use than a northern run. This continues until the XO returns. Not being much of a drinker he has the clearest head on the dock and realizes it's only a matter of time before one of the drunks slips as the mast is being raised and makes a whole bunch of paperwork for him. He pulls the skipper aside and talks some sense into him. The remaining beer is chugged and the party wraps up and the hydraulic plant goes quiet again.

submitted by Rick Simmons



- John Philip Holland built several submarines before the USS Holland, which became the first undersea craft commissioned by the U.S. Navy. The Holland was accepted on April 11, 1900 for a price of \$150,000. Today's nuclear powered submarines cost in excess of \$30,000,000 exclusive of the power plant.
- The first boat known to have been navigated under water was built in 1620 by a Dutchman, Cornelius Van Drebbel. Van Drebbel is said to have developed a chemical which would purify the air and allow the crew to stay submerged for extended periods.
- Alexander the Great (356 to 323 B.C.) ruler of Macedonian and conqueror of the known world in his time, is the first person known to have descended into the sea in a vessel of any kind.
- Over three hundred years ago, Mother Shipton, famous English prophetess, predicted the coming of the submarine when writing, “under water men shall walk, shall ride, shall sleep, shall talk.”

Gift Card
No Expiration. No Fees. Ever.
Redeem Online or In Store.

Tarjeta de Regalo
Sin vencimiento. Sin cargos adicionales.
Canjeable por Internet o en la tienda.

YOU CHOOSE THE AMOUNT
Card has no value until activated by cashier.
Terms and Conditions apply.

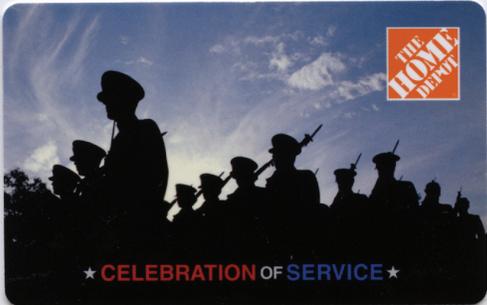
TU ELIGES EL MONTO
La tarjeta no tiene ningún valor mientras no sea
activada por el cajero. Sujeta a los Términos y Condiciones.

SERVING THOSE WHO SERVED US ALL.

★ ★ ★ ★ ★ ★ ★ ★

Between September 11 and Veterans Day 2011, Home Depot USA, Inc. will donate 5% of the amount you place on this card to The Home Depot Foundation to serve the housing needs of U.S. military veterans. Join us in a Celebration of Service to help our veterans have a safe place to call home.

To learn more, go to homedepot.com.

Between now and Veterans Day, if you purchase one of these Home Depot gift card, the company will donate 5% of the amount placed on the card to their foundation for U.S. veterans.

If you shop at Home Depot, pick up a card. It's a real painless way to help veterans.



- Records of attempts to utilize submarine warfare go back to the earliest writings in history. Herodotus (460 B.C.), Aristotle (332 B.C.) and Pliny, the elder, (77 A.D.) mention determined attempts to build submersibles.
- Interests in submarines extends to royalty and presidents. The King of England and the King and Queen of Spain are among those who have made submerged cruises in submarines. As a result of a trip in an early United States submarine, President "Teddy" Roosevelt ordered extra compensation for personnel serving in the "Silent Service." President Harry Truman made a 440 foot dive in a captured German submarine. The first President to cruise aboard a nuclear submarine was President Eisenhower who rode the USS SEAWOLF out of Newport, Rhode Island on September 26, 1957.
- Dollar for dollar and man for man, the submarine is the country's most economical weapon. Comprising only 1.6 percent of the Navy's World War II personnel, the submarine service accounted for 55 percent of all enemy shipping destroyed.
- Leonardo da Vinci, the Florentine Renaissance inventor and artist, developed plans for an underwater warship but kept them secret. He was afraid that it would make war even more frightful than it already was.
- Many instances of submarines being 'caught' by fishing vessels are on record. The NAUTILUS, world's first nuclear powered vessel, was caught in a fish net and towed the fishing vessel several miles before the situation was cleared up. There is one instance of a submarine being captured by an abandoned balloon, and on another occasion a submarine rescued a blimp and towed it to safety.
- A church in Kyoto, Japan calls its congregation to worship with a bell from a submarine. The bell, from the submarine USS RAY was purchased for the church, and was transported to Yokosuka, Japan by another submarine, the USS RONQUIL.
- For entertainment on U.S. submarines movies, television, ice cream machines and stereo music players are available. The USS SEAWOLF also had an electronic organ. There have been instances of boxing matches held onboard, and the crew of one submarine had a kite flying contest from an anchored submarine.

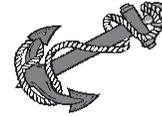


Eternal Patrol October 24, 1944

Editors Note: Less we forget, each month, one boat on eternal patrol will be highlighted in this newsletter. Sailors, rest your oars.

The Final Patrol

Lord, this departed shipmate with dolphins on his chest
Is part of an outfit known as the best.
Make him welcome and take him by the hand.
You'll find without a doubt he was the best in all the land.
So, heavenly Father add his name to the roll
Of our departed shipmates still on patrol
Let them know that we who survive
Will always keep their memories alive.



USS Tang (SS-306) 24 October 1944 78 men lost



Balao-class Submarine

Displacement:
1,550 tons (surf), 2,424 (sub)
Length: 311' 10"; **Beam:** 27' 4"; **Draft:** 16' 10"
Propulsion:
4 × diesel engines driving electrical generators
2 × 126-cell Sargo batteries
4 × high-speed electric motors, two propellers
5,400 shp (surf), 2,740 shp (sub)
Speed: 20.25 kn (surf), 8.75 kn (sub)
Range: 11,000 nmi (surfaced at 10 kn)
Endurance:
48 hours at 2 kn (sub), 75 days on patrol
Test depth: 400 ft
Complement: 10 officers, 70-71 enlisted
Armament:
10 × 21" torpedo tubes
(six forward, four aft)
24 torpedoes
1 × 5-inch / 25 caliber deck gun
Bofors 40 mm and Oerlikon 20 mm cannon

USS Tang (SS-306) was a Balao-class submarine of World War II. She was built and launched in 1943.

In her short career, the Tang sank 33 ships displacing 116,454 tons. Her commanding officer received the Medal of Honor for her last two engagements (October 23, 1944 and October 24, 1944). Tang was sunk during the last engagement by a circular run of her final torpedo.

The ship sank in 180 feet of water. Several of the crew managed to reach the surface, and some of them survived to be captured by the Japanese. These were the first American submariners to escape a sunken submarine using a Momsen lung.

Tang was the first ship of the United States Navy to be named after the tang, an Acanthuridae and close relative of the surgeonfish. The contract to build her was awarded to Mare Island Naval Shipyard on 15 December 1941, and her keel was laid down on 15 January 1943. She was launched on 17 August sponsored by Mrs. Antonio S. Pitre, and commissioned on 15 October 1943 with Lieutenant Commander Richard H. O'Kane, the extraordinarily effective former executive officer of Wahoo, in command, and delivered to the Navy on 30 November 1943.

Tang completed fitting out at Mare Island and then moved south to San Diego, California for 18 days of intensive training before sailing for Hawaii. She arrived at Pearl Harbor on 8 January 1944 and conducted two more weeks of exercises in preparation for combat. Tang stood out of Pearl Harbor on 22 January to begin her first war patrol in the Caroline Islands-Mariana Islands area.

First war patrol

On the morning of 17 February, she sighted a convoy of two freighters, their escorts, and five smaller ships. The submarine tracked the convoy, plotted its course, and then prepared to attack. An escort suddenly appeared at a range of 7,000 yd (6,400 m) and closing. Tang went deep and received five depth charges before the escort departed.

Undamaged, she returned to periscope depth and resumed the attack. The range on the nearest freighter closed to 1,500 yd (1,400 m), and Tang fired a spread of four torpedoes. Three of them hit, and Gyoten Maru sank by the stern. The submarine cleared the area by running deep and then attempted to get ahead of the convoy for a dawn attack, but the remaining freighter passed out of range under air escort.

During the night of 22 February, Tang made a surface attack on a convoy of three cargo ships and four escorts. She tracked the Japanese ships for half an hour before attaining a firing position 1,500 yd (1,400 m) off the port bow of a freighter. A spread of four torpedoes hit Fukuyama Maru from bow to stern, and the enemy ship disintegrated. Early the next morning, Tang made another approach on the convoy. The escort of the lead ship, Yamashimo Maru, moved from its covering position on the port bow, and the submarine slipped into it and launched four torpedoes. The first hit the stern of the cargoman, the second struck just aft of the stack; and the third burst just forward of the bridge and produced a terrific secondary explosion. The ship was twisted, lifted from the water, and began belching flames as she sank.

On the morning of 24 February, Tang sighted a tanker, a freighter, and a destroyer. Rain squalls hampered her as she attempted to attain a good firing position, so she tracked the ships until night and then made a surface attack. She launched four torpedoes and scored three hits which sank the freighter. The two remaining ships commenced firing in all directions, and Tang submerged to begin evasive action. She shadowed the enemy until morning and then closed the tanker for a submerged attack. Additional lookouts had been posted on the target's deck and, when the spread of torpedoes from Tang struck her, they were hurled into the air with other debris from the ship. Echizen Maru sank in four minutes as Tang went deep and rigged for the depth charge attack that followed. The next day, the submarine sank Choko Maru, a 1,794 long tons (1,823 t) cargo ship.

Tang contacted a convoy consisting of a freighter, transport, and four escorts on the evening of 26 February. She maneuvered into position to attack the wildly zigzagging transport and fired her last four torpedoes. All passed astern as the transport sped up. Having expended all of her torpedoes and scored 16 hits out of 24 attempts, the submarine put into Midway Island for refit.

Second war patrol

Tang's second patrol began on 16 March and took her to waters around the Palau Islands, to Davao Gulf, and to the approaches to Truk. She made only five surface contacts and had no opportunity to launch an attack before she was assigned to lifeguard duty near Truk. Tang rescued 22 downed airmen and transported them to Hawaii at the conclusion of the patrol.

Third war patrol

Her third war patrol was one of the most devastating carried out against Japanese shipping during the war. Tang got underway from Pearl Harbor on 8 June and hunted enemy shipping in the East China Sea and Yellow Sea areas. On 24 June, southwest of Kagoshima, the submarine contacted a convoy of six large ships guarded by 16 escorts. Tang closed for a surface attack and fired a spread of three torpedoes at one of the ships and quickly launched a similar spread at a second target. Explosions followed, and Tang reported two ships sunk. However, postwar examination of Japanese records revealed by the Japanese government show that two passenger-cargo ships and two freighters were sunk. The ships must have overlapped, and the torpedo spread must have hit and sunk two victims in addition to their intended targets. Those sunk — Tamahoko Maru, Tainan Maru, Nasusan Maru, and Kennichi Maru — added up to 16,292 long tons (16,553 t) of enemy shipping.

On 30 June, while she patrolled the lane from Kyūshū to Dairen, Tang sighted another cargo ship steaming without an escort. After making an end around run on the surface which produced two torpedo misses, Tang went deep to avoid depth charges, then surfaced and chased the hapless ship until she closed the range to 750 yd (690 m). A single torpedo blew Nikkin Maru in half, and the merchantman sank.

The next morning, Tang sighted a tanker and a freighter. While she sank freighter Taiun Maru Number Two, tanker Takatori Maru Number One fled. The submarine trailed until dark, then launched two torpedoes which sent the latter

Photo # 80-G-227987 Rescued airmen aboard USS Tang, 1944





down. Tang celebrated 4 July at dawn by an end-around, submerged attack on an enemy freighter which was near shore. However, with rapidly shoaling water and her keel about to touch bottom, Tang backed off, fired a spread of three with two hits, and then surfaced as survivors of the 6,886 long tons (6,996 t) cargo ship Asukazan Maru were being rescued by fishing boats. That afternoon, Tang sighted Yamaoka Maru, another cargo ship of approximately the same size, and sank her with two torpedoes. The submarine surfaced and, with the aid of grapnel hooks and Thompson submachine guns, rescued a survivor who had been clinging to an overturned lifeboat. While prowling the waters off Dairen late the next night, the submarine sighted a cargo ship and, during a submerged attack with her last two torpedoes, sank Dori Maru. The box score for her third patrol was 10 enemy merchant ships sunk that totaled 39,160 long tons (39,790 t).

Fourth war patrol

Her fourth war patrol was conducted from 31 July-3 September in Japanese home waters off the coast of Honshū. On 10 August, she fired a spread of three torpedoes at a tanker near the beach of Omaezaki with no hits. The next day, after locating two freighters and two escorts, she launched three torpedoes at the larger freighter and two at the other. The larger freighter {"Roko Maru"} disintegrated apparently from a torpedo which exploded in her boilers. As the submarine went deep, her crew heard the fourth and fifth torpedoes hit the second ship. After a jarring depth charge attack which lasted 38 minutes, Tang returned to periscope level. Only the two escorts were in sight, and one of them was picking up survivors.

On 14 August, Tang attacked a patrol yacht with her deck gun and reduced the Japanese ship's deck house to a shambles with eight hits. Eight days later, she sank a 225 ft (69 m) patrol boat {"No.2 Nansatsu Maru"}. On 23 August, the submarine closed in on a large ship; Japanese in white uniforms could be seen lining its superstructure and the bridge. She launched three torpedoes, and two hits caused the 8,135 long tons (8,266 t) transport Tsukushi Maru to sink. Two days later, Tang attacked a tanker and an escort with her last three torpedoes-the tanker{"No.8 Nanko Maru"} sank-and then returned to Pearl Harbor.

Fifth war patrol

After a refit and overhaul, Tang stood out to sea on 24 September for her fifth war patrol. After topping off with fuel at Midway Island, she sailed for Formosa Strait on 27 September. In order to reach her area, Tang had to pass through narrow waters known to be heavily patrolled by the enemy. A large area stretching northeast from Formosa was known to be mined by the enemy, and O'Kane was given the choice of making the passage north of Formosa alone, or joining a coordinated attack group (Silversides, Trigger, and Salmon, under Commander John S. Coye, Jr., flag in Silversides) which was to patrol off northeast Formosa, and making the passage with them. Tang chose to make the passage alone and these vessels never heard from Tang, nor did any base, after she left Midway Island.

The story of Tang's fate comes from the report of her surviving commanding officer.

On the night of 10-11 October, Tang sank the cargo ships Joshu Go and Ōita Maru. The submarine continued on patrol until 23 October, when she contacted a large convoy consisting of three tankers, a transport, a freighter, and numerous escorts. Commander O'Kane planned a night surface attack. Tang broke into the middle of the formation, firing torpedoes as she closed the tankers (later identified as freighters). Two torpedoes struck under the stack and engine room of the nearest, a single burst into the stern of the middle one, and two exploded under the stack and engine space of the farthest. The first torpedoes began exploding before the last was fired, and all hit their targets, which were soon either blazing or sinking. As the submarine prepared to fire at the tanker which was crossing her stern, she sighted the transport bearing down on her in an attempt to ram.

Tang had no room to dive so she crossed the transport's bow and with full left rudder saved her stern and got inside the transport's turning circle. The transport was forced to continue her swing to avoid the tanker which had also been coming in to ram. The tanker struck the transport's starboard quarter shortly after the submarine fired four stern torpedoes along their double length at a range of 400 yd (370 m). The tanker sank bow first and the transport had a 30° up-angle. With escorts approaching on the port bow and beam and a destroyer closing on the port quarter, Tang rang up full speed and headed for open water. When the submarine was 6,000 yd (5,500 m) from the transport, another explosion was observed, and its bow disappeared.

On the morning of 25 October, Tang began patrolling at periscope level. She surfaced at dark and headed for Turn-

about Island (25.431493°N 119.93989°E). On approaching the island, the submarine's surface search radar showed so many blips that it was almost useless. Tang soon identified a large convoy which contained tankers with planes on their decks and transports with crated planes stacked on their bows and sterns. As the submarine tracked the Japanese ships along the coast, the enemy escorts became suspicious, and the escort commander began signaling with a large searchlight. This illuminated the convoy, and Tang chose a large three-deck transport as her first target, a smaller transport as the second, and a large tanker as the third. Their ranges varied from 900–1,400 yd (820–1,300 m). After firing two torpedoes at each target, the submarine paralleled the convoy to choose its next victims. She launched stern torpedoes at another transport and tanker aft.

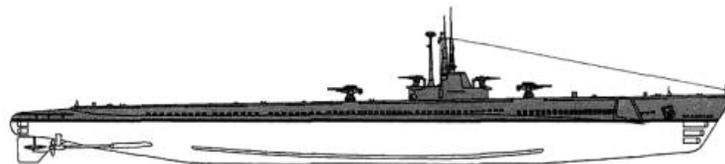
As Tang poured on full speed to escape the gunfire directed at her, a destroyer passed around the stern of the transport and headed for the submarine. The tanker exploded, and a hit was seen on the transport. A few seconds later, the destroyer exploded, either from intercepting Tang's third torpedo or from shell fire of two escorts closing on the beam. Only the transport remained afloat, and it was dead in the water. The submarine cleared to 240 ft (73 m), rechecked the last two torpedoes which had been loaded in the bow tubes; and returned to finish off the transport.

The 23rd torpedo was fired at 900 yd (820 m) and was observed running "hot, straight, and normal". At 02:30 on the morning of 25 October, the 24th and last torpedo was fired. It broached and curved to the left in a circular run. Tang fishtailed under emergency power to clear the turning circle of the torpedo, but it struck her abreast the aft torpedo room approximately 20 seconds after it was fired. The explosion was violent, and men as far forward as the control room received broken limbs. The ship went down by the stern with the after three compartments flooded. Of the nine officers and men on the bridge, three were able to swim through the night until picked up eight hours later. One officer escaped from the flooded conning tower, and was rescued with the others.

The submarine bottomed at 180 ft (55 m) and the men within crowded forward as the aft compartments flooded. Publications were burned, and all assembled to the forward room to escape. The escape was delayed by a Japanese patrol, which dropped depth charges, and started an electrical fire in the forward battery. Thirteen men escaped from the forward room, and by the time the last made his exit, the heat from the fire was so intense that the paint on the bulkhead was scorching, melting, and running down. Of the 13 men who escaped, only nine reached the surface, and of these, five were able to swim until rescued. A total of 74 men were lost. Those who escaped the submarine were greeted in the morning with the bow of the transport sticking straight out of the water.

Nine survivors, including O'Kane, were picked up the next morning by a Japanese destroyer. There were also victims of Tang's previous sinkings on board, and they tortured the men from Tang. O'Kane stated, "When we realized that our clubbing and kickings were being administered by the burned, mutilated survivors of our handiwork, we found we could take it with less prejudice." The nine captives were retained by the Japanese in prison camps until the end of the war.

In the last attack, Tang had sunk Kogen Maru and Matsumoto Maru. Tang was stricken from the Naval Vessel Register on 8 February 1945.



Need a Ride to a Base Meeting or Other Function?

Contact Base vice-Commander, [Howard Doyle \(602\) 228-2445](#) or any other Base Officer. All officers are listed near the front of every copy of the MidWatch.



CHAPLAIN'S COLUMN



National Chaplain

Carl Schmidt

23 Rockwood Road

Cabot, AR 72023

bonnynclyde@classicnet.net



Dear Perch Base members,

The United States Submarine Veterans, USSVI National Chaplain, National Officers, and USSVI members send our sympathy and condolences to all the base members of the Perch Base.

Jack S. Kimball SOS1 (SS) August 20, 2011 is now with the Supreme Commander and his shipmates on Eternal Patrol.

Let us take comfort from these words:

Timothy Chapter 4 verse 6:8

For I am ready to be offered, and the time of my departure is at hand.

I have fought a good fight, I have finished my course, I have kept the faith.

Henceforth there is laid up for me a crown of righteousness, which the Lord,

The righteous judge shall give me that day, and not to me only, but unto all

That love his appearing.

Shipmate Kimball, Rest Your Oar, We Have the Watch

Fraternally,

**Carl Schmidt ETC (SS) USN ret
National Chaplain USSVI**

Service for Our Shipmate, Jack Kimball Phoenix National Cemetery



Two petty officers and a Chief from the Naval Reserve Center provided the military honor guard,

Shipmates from Perch Base stand to the right next to the ship's bell.



Base Chaplain, Walt Blomgren, offers final remarks.

“Sailor, rest your oar.”



A Message from the Membership Chairman



Shipmates,

By the time you read this the 2012 dues renewal / Arizona Submarine Veterans Perch Base Foundation donation letters should be on their way to you. If you do not owe dues the letter is just asking for a donation to the Foundation.

The letters were sent to the address you have listed in the USSVI database. This primarily affects our "snow bird" members who have dual addresses listed. The letter will be going to whichever address you have listed as "Primary" as of September 2011.

If anyone does not receive a letter by October 15, 2011 please give me a call at 623-583-4235 (Home) or 623-512-5411 (Cell) or email me at membership@perch-base.org

We are asking that you return the bottom portion of the letter with your dues payment or donation to make sure you are properly credited. Everyone, even those who do not owe any dues or choose not to make a donation should check the contact information on the bottom part of the letter, make any needed corrections/additions and return it to me so we can make sure both USSVI and Perch Base have the best available information.

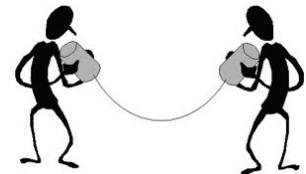
This year we are asking that you make sure you have a good contact name, along with address and phone number is appropriate, as your Next of Kin (NOK) or contact. I know what we have listed for some of you is no longer applicable due to the passing of your spouse. Some of you have not provided any contact information at all. This is very important so we know who we can contact if we cannot reach you for any reason.

Please get the payments, donations and bottom portions of the letters back to me as soon as possible. Remember the "early bird" drawing for those paying Perch Base dues.

As always, if you have any questions give me a call or send an e-mail.



COMMUNICATIONS OFFICER'S REPORT



This issue of the MidWatch is longer than I usually shoot for but, I had such great stuff in the "hopper" I just couldn't cut anything out. I am so happy and proud to be able to run the fantastic "first person" account of the WWII torpedo problems by my own personal hero, Billy Grieves. Thank you, Billy. The article is a keeper!

I've had the main torpedo article for some time but its an official Navy report and took some editing to get manageable and find appropriate photos to go with the text.

Sorry about the absence of the Minutes from September I have a printing deadline to ensure the snail-mail shipmates can get their copy on time. All of the Board members know when the deadline is and I even send out a reminder.

The calendar of events and the Hot Items (both on the web page) are up to date. There are no times listed for the events because I wasn't given any. I know that's important for Members who plan on attending but GIGO!

October Base Birthdays

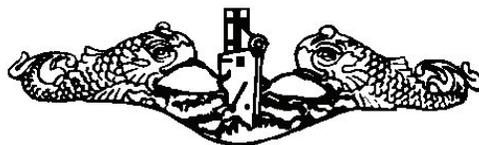
KENNETH R. ANDERSON	10/5
JOHN CASH	10/10
BUTCH DESHONG	10/23
MICHAEL J. HALER	10/1
ALBERT LANDECK	10/22
ROBERT W. LENTS	10/10
JIM A. NELSON	10/8
JAMES W. NEWMAN	10/29
CRAIG L. OLSON	10/29
BRUCE "ROBIE" ROBINSON	10/6
STANLEY I. RUD	10/21
KEN SCHONAUER	10/11
ROBERT A. SUNGY	10/14
MARTINE (MARTY) ZIPSER	10/31

SHIPMATES RUNNING ON LESS THAN A FULL BATTERY CHARGE



**Binnacle
List**

According to Base Chaplain Walt Blomgren, we have no shipmates known to be on the Binnacle List.



Canada is "Skimmers Only" for a While

All Canadian Submarines Now Out Of Commission

The Montreal Gazette, September 5, 2011

OTTAWA - The navy's last operational submarine is now sidelined until 2016, leaving the service without an underwater capability and potentially throwing into question the future of the submarine fleet.

The submarine program, which has already cost around \$900 million, has been plagued with various maintenance issues that have prevented the boats from being available for operations on a regular basis.

A media report in July noted that one of the subs, HMCS Windsor, arrived in Canada in the fall of 2001 but since then it has operated at sea for just 332 days.

HMCS Corner Brook, damaged when it hit the ocean floor during a training accident in June on the West Coast, is now dockside. It will be repaired and overhauled during a planned maintenance period now underway.

But it is not scheduled to return to sea until 2016, the navy confirmed in an email to the Ottawa Citizen.

HMCS Chicoutimi, damaged by a fire in 2004 that killed one officer, still remains sidelined. That leaves HMCS Windsor and HMCS Victoria, which are also not available for duty at sea.

"The navy is focused on HMCS Victoria and HMCS Windsor and returning both to sea in early 2012," stated navy spokesman Lt.-Cmdr. Brian Owens in an email. "Trials are already underway with Victoria in anticipation to her returning to sea."

He noted that plans call for Victoria to do a test dive in the Esquimalt harbor on Vancouver Island sometime this month as part of a plan "to verify the submarine's watertight integrity, and the functionality of other key systems."

But defense analyst Martin Shadwick said the latest news on the four submarines is yet another blow to the program.

"All the arguments the navy made for having submarines 10 or 15 years ago are still fundamentally valid, but they haven't been actually able to provide the politicians with specific concrete examples because the subs are not available all that much," explained Shadwick, a York University professor. "That makes the subs a lot more vulnerable to budget cutters in the department and outside of it."

He said the future survival of the submarine force could be put in jeopardy if the problems continue.

Canada purchased the subs second-hand from Britain and took delivery of the boats between 2000 and 2004. The navy said it did a thorough examination of the vessels to ensure they meet Canadian needs, but problems with the Victoria-class subs started materializing almost immediately.

High-pressure welds had to be replaced and cracks were found in some of the valves on the four subs. Steel piping also needed to be replaced as the submarines were put into storage in Britain with water in their



The Upholder/Victoria-class submarines, also known as the Type 2400 (due to their displacement of 2,400 tonnes), are diesel-electric Fleet submarines designed in the UK in the late 1970s to supplement the Royal Navy's nuclear submarine force. They were decommissioned with the end of the Cold War. In 1998, Canada purchased the submarines and a suite of trainers from the Royal Navy to replace the decommissioned Oberon class of submarines.

Displacement: 2,455 tons
Length: 230'; **Beam:** 24'; **Draught:** 25'
Propulsion: Diesel-electric- 1 shaft
2 x 2,035 hp diesels; 1 x electric motor (5 MW)
Speed: 12 knts (surf.); 20+ knts (sub)
Range: 8,000 nmi; **Complement:** 47
Sensors and processing systems: Sonar: Type 2040 active/passive bow,
Type 2041 micropuffs, Type 2007 flank,
Type 2046/CANTASS MOD towed array,
Type 2019 active intercept
Fire Control: Lockheed-Martin Librascope SFCS Mk 1 Mod C
Radar: Kelvin Hughes Type 1007
Armament: 6 x 21 inch torpedo tubes (18 Mark 48 torpedoes)

fuel tanks. HMCS Victoria also underwent repairs after a dent was discovered in her hull.

In addition, there have been delays in installing Canadian equipment, such as the weapons fire control and communications gear. The subs are still not capable of firing Canadian torpedoes.

“The introduction of the Victoria Class has been fraught with many issues and faced a number of setbacks,” a May 2009 briefing note produced by the navy acknowledged. The Ottawa Citizen obtained that document through the access to Information law.

In July, media reports citing other navy documents noted the subs are also restricted in the depth they can dive because of rust problems.

In June, two sailors were injured when Corner Brook hit bottom near Nootka Sound, off the west coast of Vancouver Island. The boat was conducting submerged maneuvers during advanced submarine officer training.

Owens said navy divers did an initial “in-water” damage assessment of Corner Brook. They found there was damage to the fiberglass bow dome, which Owens noted could mean that there may be damage to the sonar equipment it contains. There was also minor leakage in a forward ballast tank.

“The exact scope of the damage, and subsequent repair estimate, can only be derived after a more thorough assessment with the submarine docked and the development of complete repair specifications,” he added.

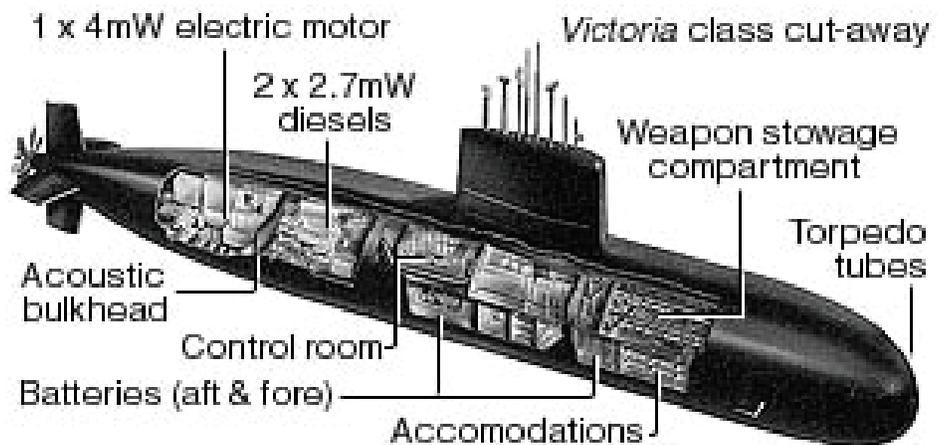
The cost of repairs is not known at this time.

HMCS Corner Brook is alongside the dock at Esquimalt and is being used as a training platform for submariners.

It is now undergoing an already scheduled maintenance regime in which minimal work is done, such as replacing certain components and doing an engineering survey of what needs to be done during a much more elaborate overhaul called the Extended Docking Work Period or EDWP.

The submarine will not go to sea again until after the EDWP.

Owens said Corner Brook’s EDWP is scheduled to be complete in 2015-16, making the vessel available for testing, trials and personnel training in 2016.



- Modern submarines can travel faster submerged than they can on the surface. They can fully submerge in less than a minute.
- Robert Fulton, inventor of the steamboat, was an avid submarine enthusiast. He built several submersible warships, one of which was known as the Nautilus.
- The rig for dive in a modern submarine requires the crew conduct more than 225 individual and operational checks.
- The submarine was not generally recognized as a legitimate instrument of warfare until the Civil War.
- Only the cream of Navy manpower is considered acceptable for submarine service. Volunteer applicants are given exhaustive physical and psychological screening before being accepted for training. Those who make the grade are trained in the Submarine School at New London and aboard operating submarines. After graduation from the Submarine School and actual service in submarines, those who pass all tests may wear the Dolphins, insignia of the submarine service.

Coming Soon!

AVAILABLE STARTING AT THE NEXT BASE MEETING



24 ounces "Big-T"



16 ounces "Short Patrol"

Both tumblers come with a snap-on cap and straw and:

- ◇ Fully double-walled for maximum insulation. Hot drinks stay hot and cold drinks stay cold
- ◇ The "Base Patch" and "Save our Sail" are real cloth patches placed between the walls of the tumblers. Never fade, peel or come off.

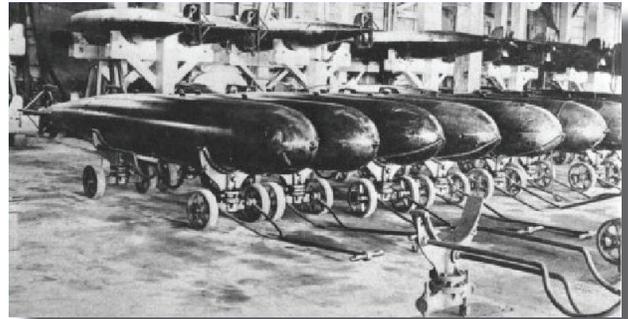
Torpedo Development During WWII

Part 1 of 2

GENERAL INFORMATION

Until the electric torpedo **Mark 18** first went to sea in September 1943, the submarine torpedoes in general use were **Mark 10** for S-Class submarines and **Mark 14** for fleet type submarines. There were a few **Mark 11**, **Mark 15** and **Mark 9** torpedoes used in submarines but in such limited numbers that their characteristics had no far reaching effect on submarine strategy and tactics.

The **Mark 10** torpedo had well over ten years of service experience. It was a steam torpedo 21 inches in diameter, weighing 2,215 pounds when loaded for a war shot. Its range was 3,500 yards, at a rated speed of 36 knots. Its warhead carried 497 pounds of TNT and later 485 pounds of Torpex. The exploder, **Mark 3**, was a simple contact exploder, designed to detonate the torpedo upon contact with the target.



Mark 10 Torpedoes

The **Mark 14** was also a 21 inch steam torpedo. It was the most recent model of submarine torpedo, comparable to the **Mark 15** destroyer torpedo and the **Mark 13** aircraft torpedo. The **Mark 16** Navy Eyale Torpedo capable of carrying 1,260 pounds of Torpex 7000 yards at 46 knots had been in the research and development stage since 1934. It never got into service. The **Mark 23** torpedo introduced later, was essentially a **Mark 14** with no speed change mechanism and capable of only operating only in high power. The **Mark 14** was, therefore the submarine steam torpedo of the war, and it had no rival except the **Mark 18** electric torpedo.

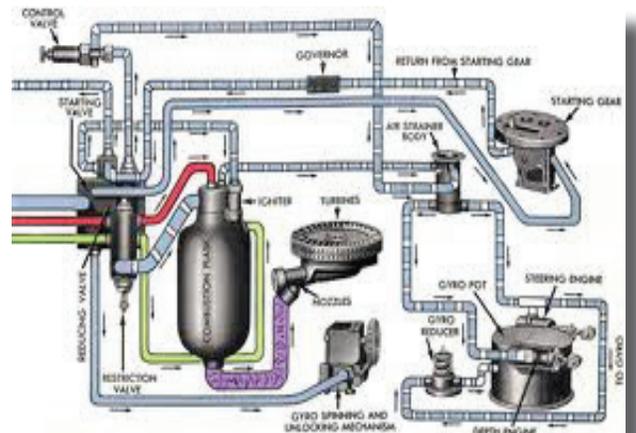


The **Mark 14** had several modifications, some of which were adapted to correct defects discovered during the war. It was a two-speed torpedo. At 46 knots it had a range of 4,500 yards, at 31.5 knots it was capable a 9,000 yard run. The earlier warheads contained 507 pounds of TNT; improvements introduced during the war boosted this war-load, in several stages, up to 668 pounds of Torpex. The warhead was fitted to carry the **Mark 6** exploder.

The **Mark 6** exploder was designed to explode in the magnetic field under a ship. It had been a long time in development but its development had been shrouded in the deepest secrecy and it was not until the middle of 1941 that it was issued to submarines. Thus,

at first only commanding officers and torpedo officers were told about it. After a short time it became apparent that torpedo-men had to be brought in to the secret in order to acquire some experience in handling it. At the outbreak of the war, the secret had been so well kept that there was practically no service experience with this exploder. By that time the Germans had found that their exploder, founded on similar principles, had failed miserably and had to be discarded.

“Torpedoes” was probably the only part of naval warfare in which the U.S. Navy was markedly inferior to the Japanese. The reason for this inferiority lies deep in the organization of the U.S. Government and the psychology of its people. It certainly cannot be shifted off as solely the responsibility of a small group of technicians. Any attempt to discover the reasons or recommend changes is quite beyond the scope of this document. It is intended here only to study the effects of torpedo development upon submarine operations.



Mark 14 "Steam Engine"

That effect was profound. Undoubtedly torpedo inferiority added months to the war and thus cost the U.S. thousands of lives and billions of dollars of treasure.

To understand what happened it is necessary to review a few broad facts. Between the two World Wars, the research, development, production, test and acceptance of torpedoes became concentrated at the Newport Torpedo Station. Until Alexandria Torpedo Station came into production about a year before the war started, there was no other source of torpedoes for the U.S. Navy. The monopoly was complete.

When torpedoes were fired in target practice they had to be set to run deep under the target in order to prevent damage to the target ship, and to the torpedo. Target practice constantly afforded a check on the submarine commander's ability to make an approach and on submarine torpedoman's ability to make torpedoes run hot, straight and normal. Evidently based

only on the ability to prevent erratic runs, was the comment of the Chief of Naval Operations in 1940 and 1941, reports of gunnery exercises, we can expect uniformly good material performance from our present submarine torpedoes.

So far as performances could be checked in target practices these expectations were warranted. But target practice offered as possibility of checking the depths at which the torpedo ran. With magnetic exploders exact depth performances was not necessary but even with them it was possible to miss in depth. Operating personnel had no means of measuring the depth at which torpedoes ran. That was the function of the proving range at Newport. Operating personnel also had no means of checking the proper functioning warheads of torpedoes. The war began with an entire generation of submarine personnel, none of whom had ever seen or heard the detonation of a submarine torpedo. These things they had to except on faith.

DEEP RUNNING MARK 10 TORPEDOES

Their faith was strong on 21 December 1941, when Lieutenant W.O. Chapple took **USS S-38 (SS-143)** into Lingayen Gulf around the end of the anti-submarine pickets that were preventing the entrance of several of our submarines. The main Japanese landing on Luzon was taking place. When it was light enough to see, Chapple fired four torpedoes, (all his tubes would hold), one each at four separate enemy loaded transports. All four missed. Chapple had set his torpedoes at 12-foot depths. In attempting to rationalize four misses at four (Set-up) targets he hit on the idea that the enemy was using shallow draft ships for the landing. He set his remaining torpedoes at 9 feet.

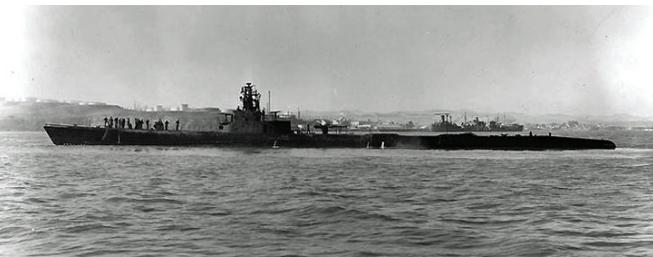


When the next opportunity came, he fired two torpedoes so set and sank HAYO MARU, a ship of 5,445 tons. After a series of hair breath escapes the S-38 succeeded in escaping from Lingayen. The heroic effort of the S-38 was about the only effective opposition the U.S. was able to offer the Japanese landing at Lingayen. Out of 5 attempts the S-38 had only one success and four unexplained failures. On the fifth of January 1942 the Bureau of Ordnance [**BuOrd**] informed Commander Submarines Asiatic [**ComSubAF**] that the **Mark 10** S-Boat torpedoes ran four feet deeper than set. This was the probable explanation of the failures.

The effect on the total of submarine results of thus belatedly announcing such a service defect in a torpedo that had been so long in service was not great. On 9 January 1942 only about 15 war-shots in all had been fired by the S-class submarines. Possibly however, it planted the first few seeds of doubt.

This defect affected only the S-Boat class submarines. The **Mark 10** torpedo was obsolescent. That any ship of the U.S. Navy ever went into desperate close action with fatally defective weapons cannot be lightly regarded. Never the less the defect affected only a small number of submarines for a very short time. Meanwhile experience was being accumulated with the more modern **Mark 14** torpedo.

DEEP RUNNING MARK 14 TORPEDOES



On 14 December 1941, **USS SARGO (SS-188)**, Commanded by Lieutenant Commander T.D. Jacobs, fired one torpedo at a 4,500 ton ship. The torpedo was set for 15 feet depth, and was fired at 1,100 yards range. Eighteen seconds after firing, and long before the torpedo could reach the target, an explosion was heard and very definitely felt aboard the SARGO. The torpedo had pre-matured. Reasoning from this experience that the enemy had devised some method of countering the magnetic-exploder, Lieutenant Commander Jacobs and his torpedo officer, C.D. Rhymes, decided to

inactivate the influence feature of the exploders on the remaining torpedoes.

The **Mark 6** exploder was a very complicated device weighing 92 pounds, carried in the torpedo warhead. Its function was to cause the torpedo warhead to explode at or under the target. Lying in the tube of a Submarine the detonator was withdrawn from the booster cavity. This was a safety feature. In this condition if any accidental shock of loading, or depth charging acted to fire the detonator, neither the booster nor the main charge would fire. Upon firing the torpedo the force of water acting upon a spinner through a chain of gearing moved the detonator into the booster cavity. This was accomplished after the torpedo had run about 450 yards. During that run, certain delayed action switches had been closed, vacuum tubes had been warmed up and the torpedo was "Armed". The spinner continued to turn a generator, which supplied power for the exploding circuit.

After arming, if the torpedo passed through the magnetic field of a steel vessel, the EMF (*Electro Magnetic Force*) generated in the exploder's induction coils was changed. This change of EMF, amplified by vacuum tubes, caused the release of the firing pin. The firing pin struck the primer, fired the detonator, which in turn fired the booster which caused the explosion of the main charge of the warhead.

(Article Continues on Page 25)



He was there!! Billy Grieves gives his “first person” account of the torpedo problems at the start of WWII.

The date was April 10, 1942. THRESHER was patrolling the entrance to the channel to Tokyo Bay. At 0955 the skipper, Bill Anderson, raised the 'scope on his regular sweep and sighted a three-ship convoy coming out the channel from Tokyo. The range was long but we fired a four-fish spread with one hit on the third freighter. The torpedoes were set shallow to strike the target but, unbeknown to us at that time, the fish were running deeper than set. But the Mark VI exploder at the base of the warhead had a magnetic feature which, when the torpedo passed within the magnetic proximity of the hull, detonated the warhead at the ship's most vulnerable point, the keel. Salt water is incompressible. Any explosion in salt water can only go one way... straight up! And when the torpedo passed beneath the stacks of the freighter, it blew the 3,039 ton SADO MARU into two sections. She erupted amidships and sank beneath the surface in two vertical sections, bow and stem.

But the magnetic feature which detonated the war head when it passed within the magnetic proximity of the hull was completely unreliable. The steel hull of every ship at sea gives off a magnetic field which will detonate the war head of the torpedo. The magnetic field was presumed to extend out in all directions and an equal distance below the keel like a huge hemisphere. But, it was found, this field is not of a fixed nor constant configuration depending on the latitude the ship is sailing at. A ship on the equator gives off a magnetic field which is flattened out like a huge disc and extends far enough away from the hull to trigger the Mark VI exploder before it ever reaches the hull. Several of our boats have watched perfect shots heading for a convoy and then detonate 100 yards short of the target. When this was learned, ADM Nimitz ordered all magnetic features disconnected.

Then there were the mechanical malfunctions of the exploder. On many occasions our skippers watched as torpedo bubbles passed under the target too deep to detonate. The skippers were furious and complained vociferously but the armchair admirals back at the naval torpedo station at Newport where the fish were developed said it wasn't the torpedoes at fault. The skippers were firing too soon and expending too many torpedoes. But our good old Admiral "Uncle Charlie" Lockwood sided with the skippers. On June, 1942 an exercise shot was fired at a torpedo net at Albany, West Australia and it was found that the torpedo passed 16 feet below its set depth. With this irrefutable evidence, the Bureau finally addressed the problem.

But that wasn't the end of the problems. On December 29, 1942, we were patrolling the Java Sea and the skipper sighted a large freighter-passenger on the horizon. We conducted the approach and fired 3 fish with no hits. We surfaced and made the old "end around" approach and fired 2 more fish.....again, no hits. In both cases both the skipper and sonar verified the fish ran deep under the target. The skipper was furious. He ordered "BATTLE STATIONS SURFACE!". I was sight-setter on the 5"51 as we took our stations on the gun. We approached the target at her starboard quarter. It was dusk but I'll never know why we weren't sighted. We commenced firing. With the first few rounds we saw the Jap gun crew running forward to man their deck gun mounted on the fo'c'stle deck at the bow. But luckily, our fifth or sixth round made a direct hit taking gun and gun crew over the side and cutting a large semicircle out of their silhouette. We fired all 85 rounds in our magazine leaving her dead in the water and the crew abandoned. Ammo expended we fired one fish from the stem tube. We in the gun crew watched intently as the line of bubbles made the 800 yard run and strike the target at her port quarter. We expected a deafening, boat rocking explosion but what we heard instead was a loud PINGG! as the 3400 lb. fish plowed into her hull. She immediately began to settle by the stern and at 0325, the 2,733 ton HACHIAN MARU slid beneath a glassy sea in a vertical position, stern first.

The problem of "dud" torpedoes was common among our boats. On one occasion, TINOSA fired fifteen torpedoes at a 19,000 ton Japanese tanker near Truk. They scored thirteen hits with TWO explosions. Eleven torpedoes were "duds." It was our "Uncle Charlie" Lockwood who found the solution. One of our boats fired three live torpedoes against the submerged cliffs of Kahoolawe. Two exploded with one dud. The dud was recovered by a diver and showed immediately the cause of the problem. To verify the results, the sub-tender HOLLAND and the base torpedo shop dropped torpedoes ninety feet from a crane to a steel plate in the dry dock confirming the cause of the duds.

The firing pin on the Mark VI exploder is shaped like a mushroom. There is a thick disc about as big as a quarter with a stem extending down from the center about two inches. On top of the disc are two pins pointed up. When the torpedo strikes the target the spring-loaded mushroom slides up a guided channel and the pins detonate two Winchester caps (the same caps found in a shot gun shell) which detonate a Tetryl booster charge which then detonates the 600 pound Torpex in the war head. But, it was found, this only worked when the war head struck the target at a glancing angle less than 90 degrees. A strait shot on a 90 degree track always resulted in a dud because the firing pin alignment was distorted and the pins did not strike the caps.

Ironically, it was the Japs who helped resolve the problem The mushroom firing pin was made of stainless steel and deemed too heavy. So, using aluminum from the propeller of a Jap fighter, shot down Dec. 7th, new firing pins were cast. And the difference was amazing. When we tested the exploder mechanism before loading and depressed the firing ring, the firing pin bounced off the overhead. The steel pins didn't even reach the overhead.

It was December 1943 before all the problems were remedied and even the Japs wondered what took so long. Successful war patrols increased dramatically after that.



(Continuation of Article from Page 23)

The exploder had a dual activation. It was designed to work not only by the ship's magnetic field but by contact with the ship's hull. If, after the exploder had armed the torpedo struck an object, the impact would cause an inertia element to release the firing pin. The chain of reactions was then the same as though the exploder had been activated magnetically.

The distance of 450 yards as an arming distance was chosen not because that distance is necessary to protect the submarine but because during the early part of a torpedo run it is subject to violent changes of speed and direction. The shock of the changes might be sufficient to detonate, the exploder. After arming the torpedo it was ready to explode except while the anti-counter mining device was in control. This was an apparatus designed to prevent the torpedo from being blown up by an explosion close to it, such as might happen when several torpedoes were fired in rapid salvo. Sea pressure acting on a diaphragm kept the firing pin locked when the pressure head was over fifty feet. The pressure wave from an explosion acted on the diaphragm to prevent the firing of the exploder for the duration of the wave, and by delayed release, until after the second wave of detonation had passed.

What SARGO's Commanding Officer Jacobs, did was to cut the electric circuits of the exploder so that it would not be activated by the ship's magnetic field. From there on SARGO torpedoes had to hit in depth as well otherwise. If they did so the contact mechanism of the exploder would detonate it.

Considering both contact and magnetic features, the torpedo would act if it went anywhere from the water line down to perhaps 15 or 20 feet under the target. A magnetic exploder therefore had a much broader target than a contact exploder. In addition, the statement is repeatedly made in the literature, correspondence, and instructions on the subject, that an explosion a few feet under the bottom of the vessel was 'Three Times' as destructive as one against its side. The principle of the magnetic exploder was new to Naval Warfare. The contact exploder was much older than the Automobie Torpedo. The Spar Torpedo with which Cushing blew up the Confederate Ram "Albemarle" was probably fitted with a contact exploder. The Confederate submarine "HUNLEY", the first one in history ever to sink a ship, undoubtedly had a Spar Torpedo with a contact exploder.

Ten days later SARGO got a chance to test the performances of the inactivated exploder. She fired three torpedoes set at 15 feet at two MARUs. SARGO was sighted at firing. The MARU took evasive action and there were no hits. Shortly afterwards they got another shot at one of the ships and fired two torpedoes set at 10 feet from 1,900 yards range. There were no hits. On 27 December CO Jacobs got another chance firing, two torpedoes at 900 yards, with a 30 degree gyro angle, for no hits.

With a record of so many misses behind him Jacobs buckled down to finding and eliminating the reason. When at 1800 on the same day, 27 December, two more ships were sighted he entered into an approach in which everything was checked and rechecked. It happened to be an approach where that procedure was possible. The target was making 9 knots and the visibility was such that almost unlimited periscope exposures could be used. The tactical data of the torpedo for large gyre angles was under suspicion, so he sought for and obtained zero gyro angle. The approach dragged on for 57 minutes. During the last 15 minutes the actual and the generated bearing of the torpedo data computer did not vary from each other by more than half a degree. At a range, of 1,200 yards two torpedoes were fired with zero gyro angle, set for 10 feet. A little while later two more were fired at the second target under very similar circumstances except that the range was now reduced to 1,000 yards. They all missed.

Jacobs and his torpedo officer were now convinced that the only reason for the misses must be that the torpedoes were running too deep. They reasoned that the warhead being heavier than the exercise head. Different rudder throws were called for. They then proceeded to compute a value for the new rudder throws and put it on the torpedoes. The performance of SARGO was most remarkable. With the very meager data afforded by one war patrol they hit upon the reasons for their misses and uncovered some of the fatal defects of these torpedoes. The remedies they adapted were the most drastic at their command, but nothing they could do aboard a submarine was capable of correcting torpedo faults, which were fundamental.

The next evening SARGO sighted a good target and trailed it all night, holding off until daylight for the attack in order that they might be sure of the target data. In trying to obtain ideal conditions, the target escaped them. On 4 January however they got a shot at a slow speed tanker at 1,300 yards. The torpedo was set at 10 feet and again it missed. SARGO had fired 13 torpedoes mostly under excellent conditions and obtained zero hits.

After the last failure, Jacobs sent a dispatch to **CinCAF** saying that in six attacks under ideal conditions he had scored no hits and submitted his belief that the torpedoes were running deep. He also informed his superior that he had changed his rudder throw on his torpedoes.

This dispatch, together with other information on torpedoes was evidently passed on, for the next day it was answered by the **CinCAF**. By dispatch he informed the submarines that SARGO suppositions that the torpedoes ran deep due the heavy heads was in error and that, if torpedoes passed under the target without firing, it was probable due to a flooded exploder. On 5 January the day after that dispatch went out, **BuOrd**, informed Commander Submarines Asiatic that the **Mark 10** torpedoes would run four feet deeper than set, and that this could be corrected by changing the rudder throws.

Even this trouble with the **Mark 10** was not enough to throw suspicions on the **Mark 14**. When SARGO got into Soerabaja her remaining torpedoes (there were several) were inspected by the Asiatic Fleet Gunnery Officer. The only defect discov-

ered was an oversized cotter key in the depth control mechanism of one torpedo. All submarines were duly informed of the necessary measures to correct this mistake in maintenance. But the **ComSubAF** had commenced to lose his faith in experts because on 26 January he had already informed all submarines that the **Mark 14** appeared to be running deeper than set and shallow depth settings should be favored. On 22 January information had arrived at a long list of corrections that were necessary to apply to the point of aim when firing **Mark 14's** with fairly large gyro angles. As these gyro angles were usually avoided even at the cost of hampering the submarines' tactics, the effects of the changes was not great. It was probable however, that they contributed somewhat to the growing loss of confidence in the torpedoes.

SARGO wanted to fire two torpedoes through nets at Soerabaja to prove the depth of running. Permission to conduct this test was refused. Soerabaja was a whistle stop in the retreat of the Asiatic submarines. To fire torpedoes with heavy warheads through nets required special facilities for their recovery. These were not available at Soerabaja. In the meantime arrangements were being made at Darwin to conduct similar tests but Darwin was abandoned before they could be held. Tjilapjap was another temporary stop and unsuitable in the bargain. It was not until submarines came to the end of their retreat at Fremantle and Albany that forces afloat could conduct a depth keeping test.

A hasty test could have been arranged at Soerabaja, but only at a risk of the probable loss of the torpedoes. This could not then be accepted. Over the first months of the war the shortage of torpedoes was a nightmare that tempered every move. 233 torpedoes were lost in the bombing of Cavite, Manila Bay, Philippine Islands. This was the greater part of the Asiatic Submarine's Reserve. The remainder was removed to Corregidor, Philippine Islands, and later taken out by the several submarines that visited there. The torpedo situation was, however to be acute for a long time. At Pearl Harbor the situation was a little better in that the reserve was left intact. Torpedo expenditures exceeded receipt, however, and the supply situation rapidly deteriorated.

TORPEDO SHORTAGE

On 1 February 1942, **ComSubPac** reported that at the Submarine Base Pearl Harbor he had 101 **Mark 14** torpedoes. Scheduled deliveries totaled 192 torpedoes between then and July. With this total of 293 torpedoes in sight, he estimated his expenditures would be 524 torpedoes and requested something drastic be done about the deficiencies. Shortly thereafter it was necessary to cut down the monthly torpedo delivery to Pearl Harbor from 36 to 24 torpedoes because of the even more critical situation in the Southwest Pacific.

All things considered, the critical torpedo supply situation was short lived. This was the first major torpedo war for the U.S.

During the war submarines alone fired 14,343 torpedoes. At the beginning, the reserve was a few hundred and the production of submarine torpedoes was about 60 torpedoes per month. To complicate matters a sizable portion of the reserve, half way around the world from the production, was lost due to enemy action. But looking at 1942 as a whole, it was found that 2,382 torpedoes were manufactured to balance an expenditure of 2,010 torpedoes. By the first of 1943 the crisis in production was over. Transportation kept the situation in the Southwest in a critical state until the middle of 1943.

After the electric torpedo came into production in late 1943, it was all smooth sailing. Production could keep up with an expenditure of over 500 torpedoes a month, and keep the supply line filled with no strain at all.

That we were able to cope with production in the early days of the war resulted from the courage, foresight and determination of the **BuOrd** in opposing political pressure to retain the long held monopoly of Newport, RI. Alexandria (VA) had been a Torpedo Station in the First World War. It had buildings and facilities worth \$2,000,000 not used since 1923.

Alexandria Torpedo Station came into production about a year before the war began. After the war started several private firms were induced to produce submarine torpedoes. Generally they made torpedoes for surface craft and aircraft. Most of the steam torpedoes fired by submarines were made at Alexandria and Newport, although many of the parts were subcontracted to a diverse list of manufacturers. "Westinghouse" made the electric torpedoes and in the last year of the war nearly twice as many electric as steam torpedoes were fired.

Until it was conquered, the threat of a torpedo shortage seriously affected the torpedo war. In the Southwest Pacific, torpedoes were rationed to submarines to provide for their more equitable distribution. As early as 20 January 1942, submarines were sent to sea with two thirds of a full load of torpedoes. In both Central (**SubPac**) and Southwest Pacific (**SubSoWesPac**) Commands mining missions were undertaken to conserve the torpedo supply. Southwest Pacific submarines were instructed



Location of the Soerabaja Naval Base on the island of Java in what was then the Dutch East Indies.

to let minor targets go by rather than expend torpedoes in their destruction.

The tactical effect of the torpedo shortage was more far reaching.

Submarine commanding officers were encouraged to fire one or two torpedoes per salvo even at relatively important targets. Practically, the single torpedo salvo nearly always resulted in a miss and therefore a wasted torpedo. In both the **SubPac** and **SubSoWesPac** the percentage of torpedo hits was computed and rather widely publicized. It seemed to have been generally forgotten that it was the absolute number of torpedo hits, which damaged the enemy, rather than a high percentage of hits.

The shortage of torpedoes undoubtedly delayed the formulation of a secret doctrine in regard to the use of spreads.

Endorsements on Patrol Reports frequently applauded extreme economy in the use of torpedoes.

This undoubtedly encouraged COs to wait for set ups and to some extent discouraged aggressive action in the exploitation of doubtful tactical situations.

The development and production of the electric torpedo was assigned to Westinghouse. It was intended thus to use the production of electric torpedoes as an additional supply without in any manner interfering with production of steam torpedoes. Actually the test and proving range facilities were so limited that when the electric torpedo reached the proving stage there was conflict between the steam and electric torpedo programs.

In order to reduce the man-hours to manufacture a torpedo, the **Mark 23** torpedo was produced in place of the **Mark 14**. This was similar to the **Mark 14** but of high speed only.

The saving of man-hours was very small and there was considerable loss in flexibility of fire control accompanied by the loss of the greater range at low power. For instance on 23 October 1944 the stopped and damaged enemy cruiser TAKAE escaped being sunk because **USS DARTER (SS-227)** had no long range torpedoes to fire from outside the alert enemy screen. On the other hand several valuable ships, that otherwise would have escaped, were sunk using **Mark 14's** in-low power.

Although the torpedo shortage thus had many indirect effects on the submarine war, few if any major targets were allowed to escape solely because of the limited supply of torpedoes.

ANTI-COUNTER MINING DEVICE

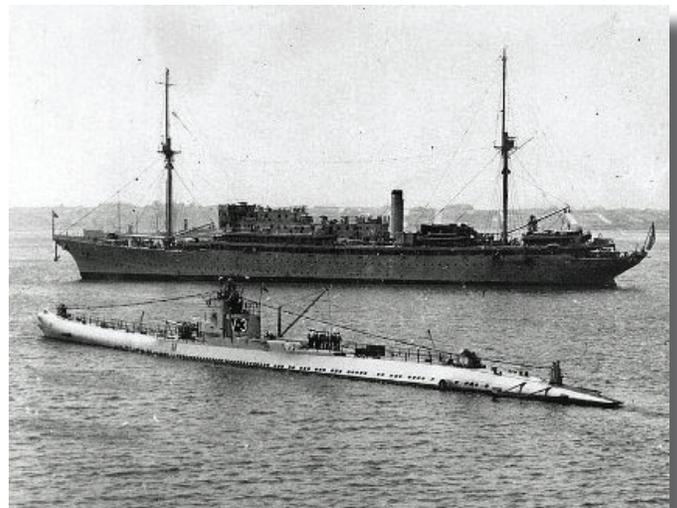
In the meantime the **BuOrd** was informed of difficulties being encountered with torpedoes. On 2 February 1942 **ComSubAF** told his submarines that the **BuOrd** advised against inactivating (**Mark 6**) exploders. The Bureau was further quoted as stating that no difficulties would be encountered with the Anti-Counter Mining Device if it was properly adjusted. It is evident from this dispatch that some suspicion had already been directed towards the Anti-Mining Device. It was considered possible that the ACM device inactivated the torpedo exploder during the initial deep dive after firing from submerged tubes, and while this was of no consequence as it took place prior to arming of the torpedo, the unlocking was sometimes delayed to such an extent that the torpedo had to rise to 15 or 20 feet depth before the exploder was fully activated. With a deep setting on the torpedo this might never take place and the exploder might be inactivated, during the entire run. The Bureau of Ordnance evidently did not subscribe to this theory.

By early April however, test apparatus had been devised by **USS HOLLAND (AS-3)** which definitely proved that the Anti Counter Mining device sometimes behaved in this fashion. A few weeks later, 29 April 1942, **ComSubPac** informed the Bureau that they also had noted the same effects. On 3 June 1942 **BuOrd** authorized the inactivation of the ACM device at discretion.

Evidence had also been accumulating that all was not well with the depth control of the **Mark 14** torpedo. In the Southwest Pacific the experience of SARGO had badly shaken confidence in the **Mark 14's** depth control. The day following SARGO's return from patrol, 26 January 1942, **ComSubAF** told his submarines that it looked like **Mark 14's** were running deep and had to favor shallow water settings.

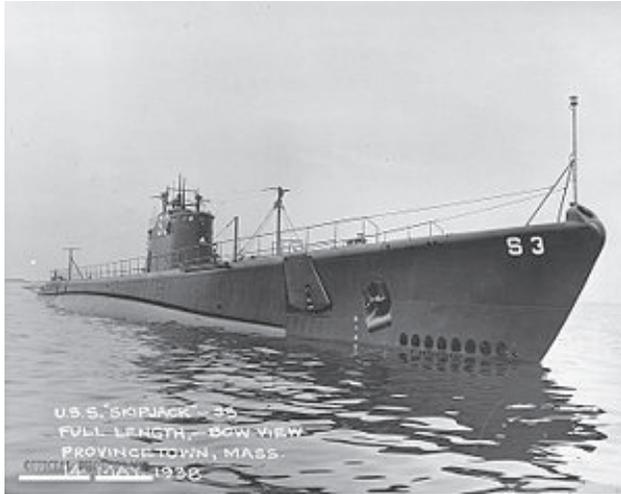
By 2 February **ComSubAF** was able to pass on to his submarines the latest word from **BuOrd**, that **Mark 14's** ran 4 feet deeper than set for the first 1,000 yards. In February, **ComSubAF** ordered his force to set depth on **Mark 14** torpedoes no greater than 10 feet except against capital ships. On the 19th of February **ComSubAF** informed the Bureau of Ordnance that probable deep running seemed the major torpedo difficulty.

Submarines brought back evidence of varying degrees of reliability that torpedoes were running deep. For instance on the 28th of May 1942, Lieutenant Commander McKinney, Commanding **USS SALMON (SS-182)** fired 3 torpedoes at a 4,382



ton freighter.

Two torpedoes were seen to hit amidships after a minute run. The target stopped and boats were lowered. The ship began to settle by the stern and took a 20 degree starboard list. McKinney thought the target wasn't sinking fast enough so almost an hour later he fired a straight stern shot from a range of 750 yards on a 90 port track. The torpedo ran hot but there was no explosion so another was fired under practically identical circumstances and it also missed. McKinney's depth settings had been, 10, 8, 10, 10 and 10 feet respectively but his hitting first salvo had been fired for a torpedo run of 1,500 yards



whereas his last two shots had been fired at less than an 800 yard run. McKinney could offer no explanation for the misses. The freighter's draft ranged from 7½ feet in the completely light condition to 24 feet in the fully loaded condition. Fortunately she later sank, but two valuable torpedoes had been wasted from a then considered ideal firing position.

USS SKIPJACK (SS-184), commanded by Lieutenant J.W. Coe returned from her Third War Patrol 3 June 1942, she was credited with sinking four ships, three of which can now be identified by name from Japanese records. A total of 18 torpedoes had been fired in high power.

Coe's patrol report contained an excellent analysis of his torpedo performances. In-so-far as can be determined from evidence collected from war shots fired against the enemy it appeared certain that SKIPJACK's torpedoes were running deep. Coe made the pertinent statement that ***"To make round trips of 8,500 miles into enemy waters to gain attack position undetected within 800 yards of enemy ships early to find that the torpedoes run deep and over***

half the time will fail to explode seems to me to be an un-desirable manner of gaining information which might be determined any morning within a few miles of a torpedo station in the presence of comparatively few hazards."

The same difficulties were evidently being encountered in the Central Pacific. However it is evident that this command did not view the torpedo performance reported by Commanding Officers as seriously as did the Southwest Pacific Command.

In **ComSubPac's** endorsement to **USS GRENADIER (SS-210)** third war patrol report, dated 18 June 1942, comments are made concerning the endorsement of Grenadier's Division Commander and several boats referred to by him. A portion of the division Commander's endorsement read as follows: *[Review patrol reports, this may actually be the Second Patrol, vice Third. OFFICIAL JANAC RESULTS TAIYO MARU, was sunk on 8 May, the Second Patrol.]*

It is reported that two torpedoes fired at the TAIJO MARU, by GRENADIER failed to detonate when they went under the target. Four Commanding Officers of this division have reported apparent failures of the **Mark 6** exploder. Disarming of the counter-mining device either may or may not eliminate failures. In the future, it is strongly recommended that torpedoes be set so as to run between the keel and two feet less than the estimated draft of the vessel attacked. This procedure should cause the torpedo to be just as effective as directly under the target and might eliminate the reported failures.

ComSubPac stated that "It is impossible to accurately prove or disprove the statement made by **ComSubDiv 62** regarding failures of the **Mark 6** exploder and proceeded to comment on each of the submarines referred to".

GUDGEON had stated that one torpedo surely passed under the target without exploding as the wake of the torpedo was seen to pass under the ship aft of the stack. The Force Commander commented "This was a miss ahead". In a second case, GUDGEON said he saw a torpedo pass under the target from periscope depth at a range of 2,000 yards. **ComSubPac's** comment was "It is believed to be almost impossible to determine from periscope depth at a range of 2,000 yards from target that a torpedo passed under the target."

USS TRITON (SS-201) Commanding Officer stated that one torpedo set for 30 feet passed under a stopped target and did not explode. **ComSubPac's** comments read "With torpedo running at such depth and knowing definitely that torpedo passed under target it is highly probable that the anti-counter mining device locked and did not unlock thus preventing the exploder from functioning".

GRENADIER fired two torpedoes at a target one of which hit the target in the stern and stopped it. The other torpedoes set for 24 feet were fired deliberately one after the other at a range of about 1,800 yards. Both missed. **ComSubPac** commented "It is not understood why the last two torpedoes fired on attack number one, in an attempt to finish off the freighter quickly after the freighter was stopped, were fired from such a long range" On GRENADIER's second attack she fired a 4-torpedo salvo for one and possibly two influence explosions. According to the spread and times her CO reasoned that the other two should have hit.

ComSubPac rationalized the misses by stating that “The first torpedo was aimed to hit the middle of the target. It is believed that the first torpedo hit aft which slowed the target sufficiently to cause the next three torpedoes to miss ahead.”

He then proceeded to remind his submarines that torpedo misses may be attributed to the following:

- Errors in range estimates.
- Errors in speed estimates.
- Errors in course estimates.
- Natural dispersion of torpedoes which is large.
- Inexperience of Torpedo Data Computer (TDC) Operator.
- Guess and snap decisions by approach officer.
- Targets maneuvering to avoid.
- Physical condition of the approach officer.

The final conclusion of the endorsement was “Commanding Officers will continue to set torpedoes at a depth not less than 5 feet greater than the maximum draft of the target”.

Meanwhile in the Southwest Pacific a “fisherman’s net” was being manufactured to end the conjecture concerning deep running. On 20 June 1942 in the quiet waters of Frenchman’s Bay outside Albany, Western Australia, a torpedo test was conducted. SKIPJACK fired a **Mark 14** torpedo that had been aboard her as a war shot for the preceding 70 days. It was fitted with an exercise head specially weighted calcium chloride solution to simulate a **Mark 16** warhead.

The torpedo was set for 10 feet and SKIPJACK fired on the surface at the net, which was 850 yards from the firing point. The torpedo cut a hole in the net at a depth of 25 feet. The depth recorder showed that following its initial dive the torpedo leveled off at 25 feet about 700 yards from the firing point. After 1,200 yards it showed a mean depth of 20 feet with a vertical weave 5 feet on either side.

The next day two more torpedoes were fired from SKIPJACK. The first one was set for 10 feet and cut the net at 18 feet having reached that depth at about a range of 700 yards after making its initial deep dive. The second torpedo was set for zero feet and cut the net at 11 feet. Upon recovery this torpedo showed evidence of having struck the bottom at 60 feet on its initial deep dive.

Commander Task Force 51, Rear Admiral C.A. Lockwood JR notified the Bureau of Ordnance of the results of the test the following day, 22 June 1942, and added that these tests seem to confirm the belief that although Southwest Pacific submarines were directed to fire war shots with maximum depth settings (10 feet) torpedoes ran much deeper and many have been observed to pass under including several typical influence explosions on deep draft ships.

On 24 June 1942, **ComSubPac** told **BuOrd** that a **Mark 14** exercise torpedo inadvertently fired set for zero feet had hit its destroyer target approximately 8 feet below the water-line. He said that information regarding depth performance for all submarine torpedoes — particularly **Mark 14’s** — was urgently required. Depth performance for torpedoes set between 0 and 10 feet was specifically requested and the additional question posed of “Have not tests indicated that torpedoes run greater than 4 feet below set depth?”

BuOrd’s answer to the report of **CTF 51’s [LOCKWOOD]** depth tests came back on 30 June 1942 and simply stated that no reliable conclusions could be reached as a result of the tests because of improper torpedo trim conditions introduced. On 11 July, **ComSubSoWesPac** told the Bureau that the tests would be repeated with an exercise head lengthened to conform more nearly in trim and buoyancy characteristics to that of a **Mark 16** war head and urged that the Bureau make conclusive tests with correct equipment and inform him of the results by dispatch.

The same day the **BuOrd** replied to **ComSubPac** stating that tests indicated torpedoes set for zero feet hunted in depth and cautioned that it should be remembered that information given by the Bureau was obtained under conditions existing on torpedo range and that forces afloat must allow for variables introduced by operating conditions.

About this time several letters from **BuOrd** indicated a tendency to shift to forces afloat the burden of tests, observation and introduction of corrective measures. Not only was this a shift of previous conceptions but the forces afloat were generally unacquainted.

The conclusion to this article will be in next month’s issue of the “MidWatch”

Return To:

U. S. Submarine Veterans, Perch Base
7011 West Risner Road
Glendale, AZ 85308
E-Mail: communications@perch-base.org

<http://www.perch-base.org>



NEXT REGULAR MEETING
12 noon, Saturday, October 8, 2011
Dillon's Restaurant at Arrowhead
20585 N. 59th Avenue
Glendale, AZ 85308-6821