US Submarine Veterans Inc. (USSVI)
Seattle Base

Volume 7, Issue 3
May - June 2005

The Dolphin Brotherhood

Meeting Recaps

Here are some short recaps of the the most recent Seattle Base meetings.

March Meeting

Our speaker for March was Dave Gordon JO1(SS) USNR (former sonar tech) from Olympia. Dave deployed to Thailand with the Tsunami Relief effort. Dave talked about the complicated path that took him from Seattle to Dallas to San Diego to Pearl Harbor to Wake Island to Guam, and finally, to Thailand. He showed a short video about the area in which he was deployed and provided lots of good information about the relief efforts by the Navy, SeaBees, and Marines.

Jay Davis and Del Hautman (sorry if I misspelled Del's name) from the Meydenbauer Bay Yacht Club presented a

check to the Seattle Base Charitable Foundation in appreciation for the Tour of the Foxtrot submarine given to yacht club members in February.

This was also the meeting where we found out that the Foxtrot had been sold to the San Diego Maritime Museum.

April Meeting

Pat Householder gave a farewell presentation for the Foxtrot. Pat has made up some CDs of the presentation and is offering them for sale (see page 10 for more information) with the profits going to the Seattle Base.

We also watched a video of the parade and burial ceremony for the crew of the CSS Hunley. The parade featured around 10,000 re-enactors in authentic period dress.

Commander's Corner

By Ric Hedman, Base Commander

Greetings,

This will be a short message due to travel and illness.

We are moving into the second quarter of the year with spring and summer bearing down on us. Plans are being made for base outings, picnics, and our Tolling Of The Boats ceremony is seeking a new venue since the sale and leaving of the COBRA.

We'd like to say thank you to all who helped on the many work parties put together by Dave Goodson in attempts to correct and improve the material condition of the vessel caused by past management. Thank you to Dave for all his hard work and inventive problem solving.

See "Corner" on Page 12

AIR-INDEPENDENT PROPULSION

AIP Technology Creates a New Undersea Threat

From Undersea Warfare Fall 2001 issue.
By Edward C. Whitman

As interest mounts in "Air-Independent Propulsion" (AIP) for enhancing the performance of small, defensive submarines, a serious new underwater threat is developing in littoral waters. Increasingly, smaller nations unwilling or unable to accept the high cost of nuclear power to achieve greater underwater endurance and longer range are turning to lower-priced and less ambitious alternatives that still offer significant operational advantages over conventional diesel-electric submarines. The best of the latter boats, such as the German-designed Type 209 or the Russian KILO, can remain submerged on battery at slow speed for periods on the order of three to five days. But now, several AIP schemes in development or already in operation can increase slow-speed endurance to as much as three weeks or a month. While still dwarfed by the potential of nuclear power, AIP offers diesel submarines a remarkable increase in capability.

AIP - The Early History

Despite their initial successes, submarine pioneers were still eager to find some means to free their boats from the necessity of surfacing frequently for access to the atmospheric oxygen demanded by the gasoline or diesel engines that charged the batteries. A number of approaches were tried, but eventually, open-cycle diesel engines, lead-acid batteries, and electric motors for submerged propulsion became the standard submarine engineering plant that served well through two world wars.

In the early 1930s, however, a brilliant German engineer, Dr. Helmuth Walter of Kiel's *Germaniawerft*, proposed a radical new submarine propulsion plant based on the use of high-purity hydrogen peroxide (H2O2) as an oxidant. In Walter's system, hydrogen peroxide from an onboard supply was decomposed using a permanganate catalyst to yield high temperature steam and free oxygen. Into the reaction chamber was injected diesel fuel, which combusted with the oxygen to yield a mixture of steam and hot gas that drove a high-speed turbine. The exhaust and condensed steam were then expelled overboard. Walter's primary design goal was high underwater speed, rather than long endurance, and indeed, his first submarine prototype, the experimental *V80*, reached 28.1 knots submerged in its 1940 trials - at a time when conventional submarines were limited to 10 knots or less. Thus, *V80*, only 76 tons and 22 meters long, also served as an early test bed for studying the dynamics and control of high-speed underwater vehicles.

Later in the war, the *Kriegsmarine* attempted to scale Walter's prototype up to a useful operational size, but although seven Type XVIIB H2O2 coastal boats were completed before Germany's final defeat, none saw combat. These Type XVIIs displaced 300 tons and were powered by two 2,500 horsepower turbines, in addition to a conventional diesel-electric plant. More ambitious plans to build larger Walter-designed ocean-going submarines, such as the 800-ton Type XXVI and the 1,600-ton Type XVIII were thwarted by the unsuccessful course of the war and the realization that the industrial capacity needed to supply sufficient quantities of hydrogen peroxide could never be achieved. However, the Type XVIII was modified into the highly successful Type XXI "electro-boat," in which larger batteries provided a submerged speed of 17 knots, which could be maintained for 90 minutes. That innovation, and the adoption of the snorkel, yielded a potent combination that strongly influenced the postwar design of conventionally powered submarines on both sides of the Iron Curtain.

AIP Fallout from World War II

After the conflict, several nations sought to exploit Dr. Walter's revolutionary propulsion concepts. As war prizes, the United States and Britain received the scuttled Type XVIIBs, *U-1406* and *U-1407*, respectively, and the latter was resurrected for experimental purposes as HMS *Meteorite*. Additionally, Walter himself and several of his key staff were brought to England and there collaborated with Vickers, Ltd. for several years in the design of more advanced hydrogen peroxide systems. The result was two 1950s-era high-speed boats, HMS *Explorer* and HMS *Excalibur*, whose design was heavily influenced by that of Walter's wartime Type XXVI. While both boats achieved stated design goals for high underwater speed, their highly concentrated hydrogen peroxide fuel created such a safety hazard that the two boats became known as "HMS Exploder" and "HMS Excruciator." Both were decommissioned in the 1960s.

The Soviet Union built a single, semi-successful exemplar of a Walter-cycle boat, known in the West as "the Whale," but their most serious AIP efforts were focused on a closed-cycle diesel plant based on the German *Kreislauf* system and their own researches prior to the war. Eventually, this led to the 650-ton Soviet QUEBEC class (1956) that used stored liquid oxygen to sustain closed-cycle operation for diesel engines on three shafts. Although 30 were built between 1953 and

1957, their safety record was so dismal that they were known by their crews as "the cigarette lighters" and withdrawn from service by the early 1970s.

Meanwhile, the United States had salvaged a 2,500-horsepower Walter turbine from *U-1406*, as well as a 7,500-horsepower version planned for the Type XXVI, and set them up at the Naval Engineering Experiment Station at Annapolis, Maryland. Subsequently, the Navy funded research on several alternative submarine AIP approaches, including variants of the Walter-cycle and *Kreislauf* systems. Eventually, unacceptable growth in the required size and weight of the corresponding engineering plants - plus the growing prospect in the late 1940s of submarine nuclear propulsion - soon brought these efforts, and those of the British and Russians, to a close. USS *Nautilus* (SSN-571) got "underway on nuclear power" in January 1955.

X-1 – The U.S. Navy's First Midget Submarine

However, in September 1955, the U.S. Navy's first midget submarine, the one-of-a-kind *X-1* (SSX-1), was launched on Long Island with a closed-cycle hydrogen peroxide/diesel plant. Inspired by the success of the British "X-craft" of World War II, *X-1* was intended for shallow-water commando operations. Displacing 36 tons submerged on a length of some 50 feet, *X-1* was powered by a heavily modified commercial diesel engine with a small battery-powered electric motor as a backup. On the surface, the ambient atmosphere charged the engine, but underwater, the oxygen required for combustion was derived from the catalytic decomposition of hydrogen peroxide in a reaction chamber. Both engine exhaust and water condensate were compressed and discharged overboard. Four hundred gallons of peroxide could be stored in a flexible polyvinyl-chloride bag forward, and the craft could accommodate four crewmembers.

After several engine failures and subsequent design modifications, *X-1* finally achieved acceptable performance in February 1957 and undertook a series of operational trials based at the Portsmouth Naval Shipyard. Unfortunately, in May 1957, an explosion in the hydrogen peroxide storage system blew off the whole bow section, and although no one was injured, *X-1*'s closed-cycle capability was never replaced. Instead, the boat was rebuilt with a small, conventional diesel-electric/battery plant and, after being laid up for three years, it was reactivated in late 1960 and subsequently used until 1973 for a variety of research studies in the Chesapeake Bay. Later, *X-1* was put on static display at the U.S. Naval Academy in Annapolis, and more recently at the Submarine Force Library and Museum in Groton, Connecticut. Significantly, her former Officer-in-Charge later wrote, "The most important lesson learned from this experimental program was… that high concentration unstabilized hydrogen peroxide has no place on a fighting ship."

Current Efforts in AIP

Although major naval powers like the United States, the United Kingdom, and the Soviet Union turned quickly to submarine nuclear propulsion as soon as it became technically feasible, smaller navies have remained committed to conventional diesel-electric submarines, largely for coastal defense. Many of these have incorporated innovations originally pioneered in the German Type XXI, but more recently, growing demand for longer underwater endurance has generated increasing interest in promising AIP technologies, both old and new. Currently, system developers are actively pursuing the following generic approaches for achieving "closed cycle" operation:

- Closed-cycle diesel engines, generally with stored liquid oxygen (LOX)
- Closed-cycle steam turbines
- Stirling-cycle heat engines with external combustion
- Hydrogen-oxygen fuel cells

Closed-cycle Diesel Engines

Typically, a closed-cycle diesel (CCD) installation incorporates a standard diesel engine that can be operated in its conventional mode on the surface or while snorkeling. Underwater, however, it runs on an artificial atmosphere synthesized from stored oxygen, an inert gas (generally argon), and recycled exhaust products. The engine exhaust (largely carbon dioxide, nitrogen, and water vapor) is cooled, scrubbed, and separated into its constituents, with the argon recycled back to the intake manifold. The remaining exhaust gas is mixed with seawater and discharged overboard. Generally, the required oxygen is stored in liquid form (LOX) in cryogenic tanks.

CCD systems have been developed by a number of firms in Germany, Britain, the Netherlands, and a few other countries. However, except for a 300-horsepower demonstration system refitted onto the German Navy's ex-*U 1* in 1993, no modern CCD systems have entered naval service. England's Marconi Marine recently acquired CCD pioneer Carlton Deep Sea Systems

and is marketing a CCD retrofit package for existing conventional submarines, such as South Korea's nine Type 209s. Although one key advantage of CCD systems is their relatively easy backfit into existing submarine engineering plants, there have been no takers. Despite the additional supply complication of needing regular replenishment of cryogenic oxygen and inert gas, there are logistics advantages in retaining standard diesel engines and using normal diesel fuel.

Closed-cycle Steam Turbines

The only steam turbine AIP under active investigation is the French MESMA system (*Module d'Energie Sous-Marin Autonome*). This is essentially a conventional Rankine-cycle turbo-alternator powered by steam generated from the combustion of ethanol (grain alcohol) and stored oxygen at a pressure of 60 atmospheres. This pressure-firing allows exhaust carbon dioxide to be expelled overboard at any depth without an exhaust compressor.

Basically, the MESMA approach is a derivative of French nuclear-propulsion experience using non-nuclear steam generation. Although MESMA can provide higher output power than the other alternatives, its inherent efficiency is the lowest of the four AIP candidates, and its rate of oxygen consumption is correspondingly higher. The first full-scale undersea application will be in Pakistan's three new Agosta 90B submarines, which will each be fitted with a 200 kilowatt MESMA system for increasing submerged endurance by a factor of three to five at a speed of 4 knots. The first installation is expected to be completed in 2001.

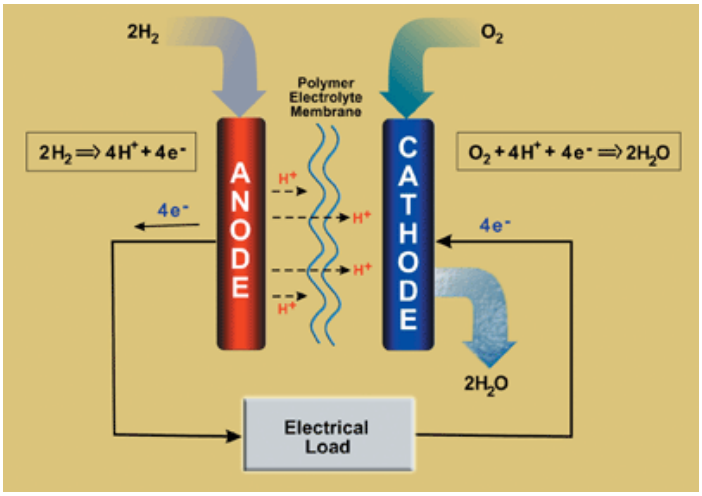
Stirling-cycle Engines

In the Stirling cycle, heat from an outside source is transferred to an enclosed quantity of working fluid - generally an inert gas - and drives it through a repeating sequence of thermodynamic changes. By expanding the gas against a piston and then drawing it into a separate cooling chamber for subsequent compression, the heat from external combustion can be converted to mechanical work and then, in turn, to electricity. Like MESMA, this approach has an advantage over internal combustion systems, such as the CCD, in that the combustion processes can be kept separate from those that actually convert heat to mechanical work. This provides significant flexibility in dealing with exhaust products and controlling acoustic radiation.

The Stirling-cycle engine forms the basis of the first AIP system to enter naval service in recent times. The Swedish builders, Kockums Naval Systems, tested a prototype plant at sea in 1989, and today, three Swedish *Gotland*-class boats are each fitted with two adjunct, 75 kilowatt Stirling-cycle propulsion units that burn liquid oxygen and diesel fuel to generate electricity for either propulsion or charging batteries within a conventional diesel-electric plant. The resulting underwater endurance of the 1,500-ton boats is reported to be up to 14 days at five knots, but significant burst speeds are possible when the batteries are topped up.

Fuel Cells

In simplest terms, a fuel cell is an electrochemical conversion device that combines hydrogen and oxygen to produce water, electricity, and heat. Fuel cells are already seeing a number of promising applications in the space and automotive industries, and many authorities believe that fuel cells offer the best potential for developing more capable AIP systems in the future. There are several alternative configurations, but for submarine propulsion, so-called "Polymer Electrolyte Membrane" (PEM) fuel cells have attracted the most attention because of their low operating temperatures (80° Centigrade) and relatively little waste heat. In a PEM device, pressurized hydrogen gas (H_2) enters the cell on the anode side, where a platinum catalyst decomposes each pair of molecules into four H^+ ions and four free electrons. The electrons depart the anode into the external circuit - the load - as an electric current. Meanwhile, on the cathode side, each oxygen molecule (O_2) is catalytically dissociated into separate atoms, using the electrons flowing back from the external circuit to complete their outer electron "shells." The polymer membrane that separates anode and cathode is impervious to electrons, but allows the positively



Overview of the basics behind Fuel Cell operation.

charged H^+ ions to migrate through the cell toward the negatively charged cathode, where they combine with the oxygen atoms to form water. Thus, the overall reaction can be represented as $2H_2 + O_2 => 2H_2O$, and a major advantage of the fuel-cell approach is that the only "exhaust" product is pure water. Since a single fuel cell generates only about 0.7 volts DC (direct current), groups of cells are "stacked" together in series to produce a larger and more useful output. The stacks can also be arrayed in parallel to increase the amount of current available.

The greatest challenge for fuel-cell AIP systems lies in storing the reactants. Although oxygen can be handled with relative safety as LOX, storing hydrogen onboard as a liquid or high-pressure gas is very dangerous. One solution is to carry the hydrogen in metal hydride accumulators, at low pressure and ambient sea temperature. (A metal hydride is a solid compound of hydrogen and metallic alloy, in which individual hydrogen atoms occupy interstitial positions in the host metal's crystalline lattice. By manipulating temperature and pressure, hydrogen gas can be absorbed or released at will.) Another, less efficient, approach is to generate gaseous hydrogen from a stored liquid hydrocarbon such as diesel fuel, kerosene, or methanol. This requires an auxiliary device called a "reformer," in which a mixture of hydrocarbon and water is vaporized and superheated under pressure to yield a mixture of hydrogen and carbon dioxide.

Several manufacturers are currently offering fuel cell systems for submarine AIP. Prominent among these is the German *Siemens* firm, which is collaborating with *Howaldtswerke Deutsche Werft* (HDW) and Italy's *Fincantieri* to supply fuel cell installations for the forthcoming 1,840-ton German and Italian *U 212*-class submarines. These will consist of nine PEM fuel-cell modules each nominally rated at 34 kilowatts, to yield a total of approximately 300 kilowatts (400 horsepower). With metal-hydride hydrogen storage, the system is predicted to yield 14 days submerged endurance and the ability to run up to eight knots on the fuel cells alone. *Siemens* is working on a next-generation PEM module rated at 120 kilowatts, and two of these will be incorporated into HDW's 1,860-ton *U 214* boats, planned as export successors to the *U 212* series. Other nations, such as Russia and Canada - the latter with significant under-ice requirements - are also considering fuel-cell modules for either new construction or for upgrading older boats.

Other key advantages here are both higher efficiency and lower specific stored-oxygen consumption than the other alternatives.

An AIP Perspective

Although it is a remarkable tribute to Hellmuth Walter's engineering genius that he fielded a fully functional - if troublesome - 5,000-horsepower AIP system in 1945, the maximum power output of current AIP installations is typically on the order of 400 horsepower (300 kilowatts). In comparison, the conventional diesel-electric plant of the *U 212* class described above is rated at over 3,000 horsepower, and a typical nuclear submarine propulsion plant produces over 20,000. Since the power required to propel a submerged body varies with the cube of its velocity, it should be apparent that at least for the near future, AIP will be valuable primarily as a low-speed, long-endurance adjunct to the under-water performance of conventional submarines. There is little short-term prospect for AIP to become a primary, full-performance alternative to either diesel or nuclear power. Even the phrase "closed cycle" is something of a misnomer, because except for fuel cells, all AIP alternatives require ejecting exhaust gases overboard, which limits both depth capability and stealth.

However, this is not to minimize the dangerous potential for AIP submarines to complicate seriously both coastal defense and assured access to littoral regions. If their distinctive characteristics are exploited by skillful operators, AIP submarines can be used to telling effect for both short- and medium-range missions. AIP dramatically expands the tactical "trade-space" for diesel-electric submarines. If conditions permit, they can transit rapidly on the surface without unduly expending the wherewithal for superior underwater performance. Submerged, they can opt for a long, slow, silent patrol that keeps their batteries fully charged and thus capable of powering speed bursts of significant duration. And by carefully husbanding their resources, they can revert again to slow-speed operation and repeat the cycle several times over weeks of submergence. Moreover, AIP technology is evolving rapidly, and some experts predict, for example, that the power output of a typical fuel cell module could well double or triple in the next several years, allowing an even more advantageous trade-off between underwater speed and endurance.

Their tactical flexibility, their small size, their inherent stealth - and the novel operational paradigms AIP submarines introduce to undersea warfare - will make these new boats a dangerous threat to submariners accustomed to nuclear- or conventionally diesel-powered adversaries. The Submarine Force needs to understand this threat - where it's been, where it's going, what it means, and how to counter it.

My Indoctrination

By Bill W. Godfrey

The following article is a reprint from the October 17, 1960 issue of Life Magazine. In August of 1960 having just completed Sub-school, I was walking down Fisherman's Wharf in San Francisco looking for my new home. There she was, tied up to Pier 45 looking like a race-horse rearing to go with a new burr, (me), under her saddle blanket.

We left the next week. After hearing some old salty stories about liberty in town from some of my shipmates and new friends, I was immediately accepted and was invited to join with them on a few final forays into town to learn the ropes. This Life article is an account of my first experience of life under the Sea after we got under way.

Underwater Vigil for a Diver's Life

By Davis Thomas, LIFE Correspondent

Beneath the choppy surface of the Pacific, a long and agonizing vigil recently took place aboard the submarine *U.S.S. Redfish*. The scene of the vigil was the submarine's painfully cramped escape trunk, a narrow passageway leading from the sub's torpedo room to the deck. Sealed inside it were two men, a Navy medical technician named Donald Raymond and his patient, David Merwin, a young Marine frogman.

Merwin had been taking part in a training exercise down in 35 feet of water south of San Francisco. Suddenly feeling "strange and shot," he had risen quickly to the surface. A physical examination revealed only a slightly below normal temperature, but next day Merwin was found semiconscious in his bunk, gasping for breath. He was writhing desperately and having convulsions.

Merwin was suffering from a collapsed lung. Although it was impossible to tell exactly what had brought on this dangerous condition, one medical speculation put forward later was that during his dive a small air bubble had escaped from his lung into his chest cavity. When he surfaced, this bubble might have expanded under the change in air pressure and finally caused the lung to collapse.

Whatever the cause, the men on Redfish decided that Merwin should be placed in a "recompression chamber," a sealed tank where the air pressure is increased until any bubbles in the diver's body are reduced in size and can be absorbed into the system. The pressure in the chamber is then gradually brought back to normal over a period of hours.

But in Merwin's case the nearest chamber was 160 miles away in San Francisco, and a heavy fog made helicopter flying impossible. Merwin was clearly dying. There was only one chance: to use *Redfish*'s escape trunk as a makeshift recompression chamber. This passageway to the sub's deck has a hatch at each end. It could contain the necessary amount of air pressure only in deep water, where the tremendous force of the water itself would keep the outer hatch tightly sealed.

Redfish's captain, Lt. Commander Charles H. Lowry Jr., headed for sea. Merwin was hastily lowered into the escape trunk. Corpsman Donald Raymond, who had had previous experience with divers in recompression chambers, volunteered to join him. The two men were jammed into a space only five feet high and about three and a half feet in diameter.

In the cramped trunk Raymond tried to make his patient comfortable. As the sub dove to a depth of 165 feet, which was where the recompression would begin, Raymond made Merwin lie on his side with his knees tucked up near his chest. Even in this fetal position Merwin, six feet tall and weighing 185 pounds, entirely filled the bottom of the trunk. Raymond, a six-footer himself, could not stand up. He made a seat for himself on a valve wheel halfway up the side of the trunk, lowered his head and braced his feet on pipes lining the walls. He planned to hold this impossible position, or minute variations of it, for the next day and a half. This was the length of time it would take to bring Merwin back to normal-if it could be done at all.

At a depth of 165 feet Captain Lowry shut off the sub's motors and *Redfish* hovered silently. As compressed air was piped in, the pressure in the trunk was increased. Checking Merwin with a stethoscope, Raymond found that the sick man immediately began to breathe more easily, but he was still twitching convulsively with chest cramps.

After 70 minutes at this level the cramps stopped and Merwin spoke for the first time. "It's wonderful to be able to breathe," he said. "I feel fine. Let's go to the surface." "Look here, Marine," Raymond said happily. "We won't be on top for another 36 hours." The air pressure made their voices abnormally high pitched.

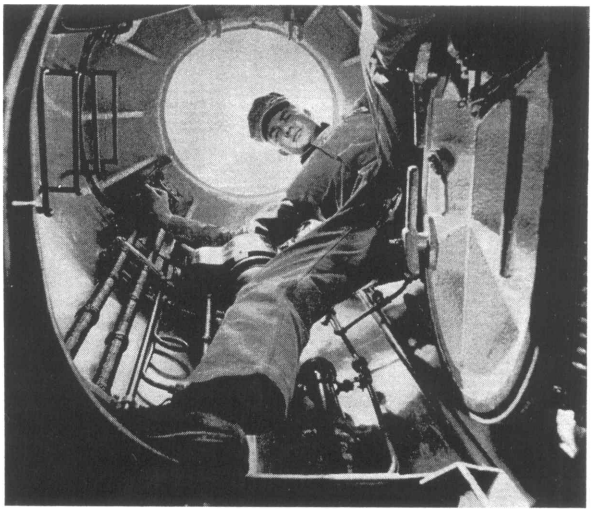
As time passed Lowry began to worry about the batteries, which enabled the sub to function deep under water. The batteries were low, and they could not be recharged without coming to the surface. Another of Lowry's worries was carbon dioxide. There were 90 men aboard *Redfish.* Every time each one of them breathed, carbon dioxide was added to the air. Eventually this carbon dioxide would so foul the air that men could no longer live on it. To conserve precious oxygen, Lowry ordered everybody not on watch to his bunk. A sticky powder which would absorb carbon

dioxide was spread heavily over the deck of the engine room. To save the batteries, Lowry shut off all the electrical equipment he could spare, and the galley was closed down. The crew would have to live on sandwiches. Lowry brought *Redfish* to a level of 150 feet, started his motors and set course for San Francisco at a dead slow speed of 2.7 knots.

In the escape trunk, the two waited out the tedious, cramped process of decompression. As the hours passed, the pressure was gradually dropped to the equivalent of. 140 feet, then 120 feet, then 100 feet. Water from condensation coursed down the walls of the vault and both men got miserably wet. By this time Merwin was feeling fine and wanted to go to sleep. But Raymond, unbearably drowsy himself, kept waking his patient with the stethoscope. To keep Raymond awake so that he could guard his patient, crewmen in the sub, below told him jokes by phone and Raymond passed them along to Merwin. One torpedoman tantalized Raymond with remarks about the joys of a refreshing cigarette or a hot cup of coffee. Two other crew members immediately beneath the escape trunk worked silently, guided by a stopwatch and decompression tables, to lower the pressure in the chamber.

To give Merwin confidence, Raymond told him about his service at the diving tank at Pearl Harbor and said that he had "ridden out" half a dozen decompressions with sick divers. Under Merwin's questioning he admitted that he had once lost a man during decompression. "But you seem a lot better than he was," Raymond said optimistically. "Don't worry about me," Merwin said.

After 16 hours below the water, Lowry finally decided that he would have to surface. The batteries were now seriously depleted, and the carbon dioxide level was becoming intolerable.



Donald Raymond in the Redfish's escape trunk

Several of the crew reported headaches and nausea. By this time the pressure in the trunk had been dropped to the equivalent of 40 feet. Lowry believed, and prayed, that the hatches would now hold the air pressure even at the surface.

The gamble worked. With more than 20 hours still to go in Merwin's treatment, *Redfish* surfaced, gulped fresh air into its ventilation system and, running on its diesels, headed for San Francisco. Inside the escape trunk the pressure held firm.

But Merwin and Raymond now faced a new hazard. The sea was running heavily, and *Redfish* began to pitch and roll. Merwin turned green. "Don't you get sick," Raymond pleaded. "If you do, I surely will too. We've got almost another whole day together in here." Merwin managed to control his stomach.

In the eight hours it took *Redfish* to reach San Francisco, Raymond and Merwin squirmed around as well as they could in their tiny vault. They talked about themselves and about their plans for the future. Raymond, who is planning to stay in the Navy, told Merwin about his wife and family. Merwin talked about China, where he was born in 1935, and about his missionary parents. He told Raymond about his plans to enter the University of California, major in Asian studies and go out for the football team.

When the sub docked in San Francisco, the pressure in the escape trunk was down to the equivalent of a depth of 30 feet. There were some 12 hours still to go. A regular pressure chamber was available on a nearby barge, but it was decided to keep Merwin where he was rather than risk making a change.

The pressure was dropped to 20 feet. Then, after the two men had spent 36 hours and 17 minutes in the cramped trunk and the pressure was being reduced to a 10-foot equivalent, one of the hatch seals popped. Instantly the trunk pressure dropped to sea level and became useless. Merwin, almost at the end of his treatment, would be in danger again if he was not put back under pressure promptly. Hastily Merwin was transferred to the barge and shoved into his new chamber. They made it in exactly two minutes and seven seconds. A few hours later he was taken, fully recovered, to Oakland naval hospital. Although he had been close to death, his lungs showed no scars or damage. He would be able to dive again.

Actually it was Donald Raymond who showed the most visible signs of the ordeal in the trunk - the brass valve wheel where he had crouched for most of 36 hours left a lingering imprint on his brave backside.

See "Indoctrination" on Page 12

FOXTROT CHANGES HOME PORT

By Pat Householder

The Russian submarine at Pier 48 in Seattle was sold to new owners, effective March 20 2005, and plans are in place to move the submarine to San Diego where it will become an exhibit at the San Diego Maritime Museum.

On Saturday, March 18th, USSVI Seattle Base members have removed all personal gear from Cobra, secured all lights and power supplies, lowered the flags, locked the doors, and departed Pier 48. The last USSVI Seattle Base members aboard for the closedown were (in no particular order) Ric Hedman, Peter "Pirate Pete" McCafferty, Karl "Dutch" Krompholz, Dave "Cobra COB" Goodson, Bob Opple, Steve "Diamond" Friedley, and me, Pat Householder.

We're sorry to see her go but it was a good three years for all subvets involved.

All told over forty subvets representing three bases worked on the boat or as docents. We met many subvets who had never heard of USSVI, a lot of money was raised through donations for the Subvets Charitable Foundation, and the base made money selling items in the store. Foxtrot volunteers and docents included:
William Baker, Donald D. Bassler, Michael G. Bennett, Andreas T. and Donna Benson, Peter Berkebile, Chris Breum, John B. Bush, George Debo, Bruce E. Fisher, Stephen H. Friedley, John M. Gardner, Don Gentry, Jerome Gerten, William M. 'Bill' Giese, Dave Goodson, Peter Goodson, Ron & Simon Grant, James H. Harper, Richard C. Hedman, Michael Hein, Patrick F Householder, Karl Krompholz, Edward Lemay, Will Longman, John Mansfield, James H. Marr, Peter and Christopher McCafferty, Gary A. Ness, Clifford C Nutter, Robert W Opple, Charles Quimby, Jim Reilly, Sam and Alice Ronnie, Charles R. Ryan, Donald Sass, Ervin O Schmidt, David Schueler, Steven Shelton, Donald M. Smith, Jan Stiffey, Theodore C Taylor, Robert C Vanderway, Phil R Ward

Pat Householder, Ric Hedman, and Dave Goodson on the assisiting tug

Part of our 'deal' with the previous owners was to allow all USSVI members free access upon presentation of their membership card, and many from across the country took advantage of that arrangement. Best of all, it brought many NW subvets back to their roots in working to restore the submarine, and we had a good time doing it.

Dave Goodson (Cobra COB) poured his heart and soul into the maintenance and restoration of the "Rusty Russki" and all the docents and restoration crew share in his sadness in seeing it so abruptly depart.

With the arrival of the Foxtrot in San Diego, we hope the San Diego Subvets will get involved and pick up where Seattle Base left off, because we had many projects in process that had to be closed down.

Here is a link to some photos from the Seattle Base member's last day on the Russian Foxtrot "COBRA". http://www.ofoto.com/I.jsp?c=xmc75wt.9h4b896l&x=0&y=-gkohgo

The Foxtrot on her way to San Diego

The Foxtrot arriving off Pt. Loma

Foxtrot Volunteers

As most of you know, Pat Householder can rarely be found without his digital camera in hand. During the Foxtrot's time in Seattle Pat took a lot of pictures of the work (and general goofing around) that happened on the sub. Here are some pictures of the Foxtrot volunteers. Thanks to all for the hard work.


Donald Bassler


Jim Harper


Stephen Friedley

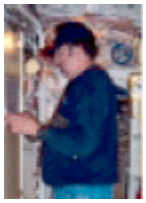

Pat Householder

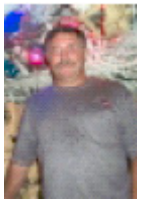

John Mansfield


JanStiffey

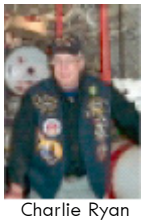

Mike Bennett


Bill Baker


Bill Giese


Bill Teasdale

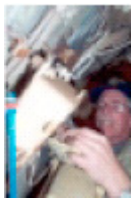

Bruce Fisher


Charlie Ryan


Chris Breum


Cliff Nutter


Dave Schueler


Steve Shelton


Don Sass


Don Gentry


Don Masoero

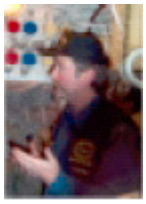

Jim Marr

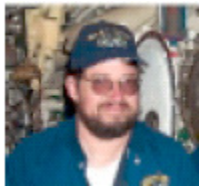

Don Smith


Gary Ness


Karl Krompholz


Lee Wise


Will Longman


Pete McCafferty


Ervin Schmidt


Floyd Davis


George Debo


Charles Quimby


Ted Taylor


Gordon Tibbets


Ric Hedman


Peter Berkebile


Peter Goodson


Ian Ellis

Foxtrot Programs

At the April 20 Seattle Base meeting Pat Householder showed a special short movie complete with soundtrack about the Foxtrot's departure and with a tribute to the Foxtrot SubVet "Crew". Anyone wishing to get a copy of the movie can do so for $ 10.00, the profit after expenses going to Seattle Base. Please note however, the movie is in Windows Movie Maker format so it can only be viewed on a Windows based computer with Windows Media Player, probably Ver 9 or later.

Also available as a Video CD (VCD Format/ MPG) is the FOXTROT GUIDED TOUR CD (that we were selling in DVD format to the Tourists for $ 20.00 ea). This version, which will play on the PC using QUICKTIME, Windows Media Player and other MPG players, also for $ 10.00. As above, the profit after expenses going to Seattle Base.

A Hi Rez version of the Foxtrot photo posted at the link is also available as 5 x 7 ($3.00) or 8 x 10 (5.00). As above, the profit after expenses going to Seattle Base.

If you are interested in getting any of these items, please let Pat know.

Birthday Wishes

Here is a list of Seattle Base member birthdays for May and June. Be sure to wish them a 'Happy Birthday and many returns' the next time you see them, offer to buy them a drink, and see if you can guess how old they really are.

Ian Ellis	May 5
James Binnion	May 6
Richard Moe	May 6
Kingsley Parker	May 8
Richard Lanzner	May 12
Steven Shelton	May 12
Robert Vanderway	May 15
Mark Schaefers	May 18
George Debo	May 21
Lee Bicknell	May 23
Jon Jolly	June 2
Dave Goodson	June 3
Charles (Chip) Wellington	June 6
William Coleman	June 11
Tom Oliver	June 22
Gary Ness	June 24
John Bush	June 27

On the Internet:

USSVI National Website: http://www.ussvi.org
Seattle Base Website: http://seattlebase.donmac.org
Ron Martini's BBS: http://rontini.com/bbs
Don Gentry's BBS: http://www.submarinesailor.com/forum

2005 Seattle Base Officers and Chairs

Commander:	Ric Hedman	206-335-7424
Sr. Vice Commander:	Karl "Dutch" Krompholz	253-631-5736
Jr. Vice Commander:	Stephen Friedley	425-806-9116
Secretary:	Steve Shelton	206-526-1130
Treasurer:	Jim Harper	425-357-6485
Membership Chair:	Stephen Friedley	425-806-9116
Ceremonies Chair:	Don Masoero	253-569-1916
Base Chaplain:	Don Smith, Mike Bennett	360-273-9416 206-767-1934
Chief of the Boat:	Ted Taylor	425-228-3764
Newsletter Editor:	Dave Schueler	206-243-6784
Base Storekeeper:	Bill Giese	425-355-5590
Webmaster:	Don Smith	360-273-9416
Foxtrot COB:	Dave Goodson	425-823-3507

Upcoming Meetings

May 18 at Redmond VFW Hall
Jun. 15 at Redmond VFW Hall

All meetings start at 7:00 PM with social time in the lounge before the meeting.

Base Library

The base has created a small lending library of books and videotapes. If you have borrowed something from the base library, you may want to look and see if you have returned it. These books and tapes are donated to the library for members to use and return, so other members can have a chance to read and view these items. Some members donated original videotapes for library use, not to be given away.

Email Address Checks/Updates

For those of you with email, we would appreciate it if you verify that your email address is correct. To verify you email, go to the Seattle Base website (http://seattlebase.donmac.org/index.htm), once have entered the website click on the List of Members link and enter the password (klaxon). You can see the list of members and email addresses. If your email is wrong, send an update to the base webmaster at: webmaster@donmac.org

Proposed Bylaw Changes

Due to the change in the dues structure on the National level, the following Seattle Base Bylaws are recommended to be changed as shown below. Be sure to review the proposed changes and be ready to discuss and vote on the proposed change at the next meeting. A copy of the current bylaws can be found online at: http://seattlebase.donmac.org/Base-Bylaws.htm

PROPOSED BYLAWS ARTICLE CHANGE:

Article II

DUES

ANNUAL MEMBERS:

Seattle Base dues are set by the Seattle Base Executive Board and shall be renewable at the then current Seattle Base annual dues rate. *(The current dues structure is $40.00/5 yr term; $25.00/ 3 yr term; or $ 10.00/1 year (Feb 2005)).* Annual Membership fees are due and payable on January 1st and membership will be terminated if still unpaid on April 1st of the due year. The Annual dues rate may be changed by a majority vote of the Seattle Executive Board and will become effective when ratified by a majority vote at a subsequent Seattle Base Meeting. A Seattle Base member is considered "*in good standing*" if both National and Local Dues have been paid for the current year. Members in good standing of other USSVI Bases shall be eligible to add Seattle Base or transfer to Seattle as their primary base for the current annual Seattle Base dues rate at the time of transfer.

LIFE MEMBERS:

A member may in addition become a Base Life member by paying Base Life Membership dues. The dues structure will be as follows: Age 65 and older: $50.00, Age 55 to 64: $100.00, Age 45 to 54: $150.00, under 44: $250.00. The member must also be, or simultaneously become, a National Life Member. Non-life Members achieving Holland Club status effectively become National Life Members and are eligible for Seattle Base Life membership.

Rainiers Ballgame

An outing to a Tacoma Rainers baseball game is planned for Friday, July 29. Be sure to mark your calendar and watch for more information here and at base meetings.

Armed Forces License Plates Approved for Washington

Olympia - Legislation requested by the Washington State Department of Veterans Affairs to allow license plates to be issued honoring the six different branches of the armed forces has been delivered to Governor Christine Gregoire for signing.

Once signed, beginning January 2006, the Washington Department of Licensing will issue license plates with six separate designs, each containing a symbol representing a different branch of the armed forces to include Army, Marine Corps, Navy, Air Force, Coast Guard, and Washington National Guard. Purchasers will also receive a decal indicating their military status, to include "veteran", "disabled", "reservist", "retiree", or "active duty."

The special license plates may be used in place of regular or personalized license plates for motor vehicles required to display one and two motor vehicle license plates.

"Washington State's Veteran Community has advocated for a specialized license plate honoring their military service and sacrifice for many years," said WDVA director John King.

During past legislative sessions, proposals for the plates have not passed.

"This year, due to the creation of the Special License Plate Review Board, the veterans were able to demonstrate support for the Armed Forces license plates by collecting more than 12,200 sets of plate requests prior to asking the state to obligate funds to create them," said King.

All moneys received by the sale of the plates will be directed to the Veterans Stewardship Account for activities that benefit veterans, such as providing programs and services for homeless veterans; establishing memorials honoring veterans; and maintaining a future state veteran's cemetery.

Did You Know?

The most successful submarine on any navy in World War II was Germany's *U-48*. Under the command of three skippers, this submarine sank 51 ships for 310,007 gross tons. While Schultze, Rösing and Bleichrodt were actually the commanders, many give credit for the boat's success to the I.W.O., 'Teddy' Suhren who, it is said, did most of the shooting. When Bleichrodt was up for his Knights Cross, he said that he would not accept his unless Suhren got one too.

USSVI Seattle Base Newsletter
c/o Dave Schueler
10631 31st Ave SW
Seattle, WA 98146

To:

"No matter where you travel, when you meet a guy who's been...
There's an instant kind of friendship 'cause we're brothers of the 'phin."
- Robert Reed, G.W. Carver (SSBN-656) -

"Corner" continued from Page 1

Now comes the hard part. I am placed in a position of needing to resign my post as base commander due to leaving the area for employment reasons. Karl "Dutch" Krompholz, Sr. Vice Commander, will be taking over the reins of the base. I am moving to Providence, Rhode Island in May to manage the Russian Juliett submarine owned by The Saratoga Foundation. The post is for the summer but may well extend longer and this would put the base at a disadvantage if I continued on as base commander. I will due this formally at the May meeting.

It has been a great time for me and I enjoy all your companionship and I do regret doing this. I will no doubt see all of you again. Thanks to all of you who have helped make this base a very good and successful one.

Fair winds and following seas shipmates.

Ric Hedman

"Indoctrination" continued from Page 7

Ironically, 25 years later I was walking down the same wharf with my wife and youngest daughter and her friend.

"Mom, where's Dad going?, He looks like a zombie".

"I think it's what they refer to in the male species as The Call of the Wild." she answered.

We had just walked up to Pier 45, and there she was again. I didn't notice until we were right up to the gangway that this was the U.S.S Pampanito SS-383 and not the Redfish, but in my mind I was coming home. I was proud that my wife, daughter, and her friend did show a genuine interest as we went aboard and below to the FTR to begin our self guided tour. I began explaining everything to them; including showing where I had strapped a mattress to an outboard torpedo rather than hot bunk and describing the acrid smell of the CO2 absorbent. It was then that I noticed about a half dozen other tourists with us, listening attentively and asking questions of me. It was fun being the unofficial docent through the rest of the boat.

Fraternally, Phin Brother:
Bill W. Godfrey.