FACEPLATE

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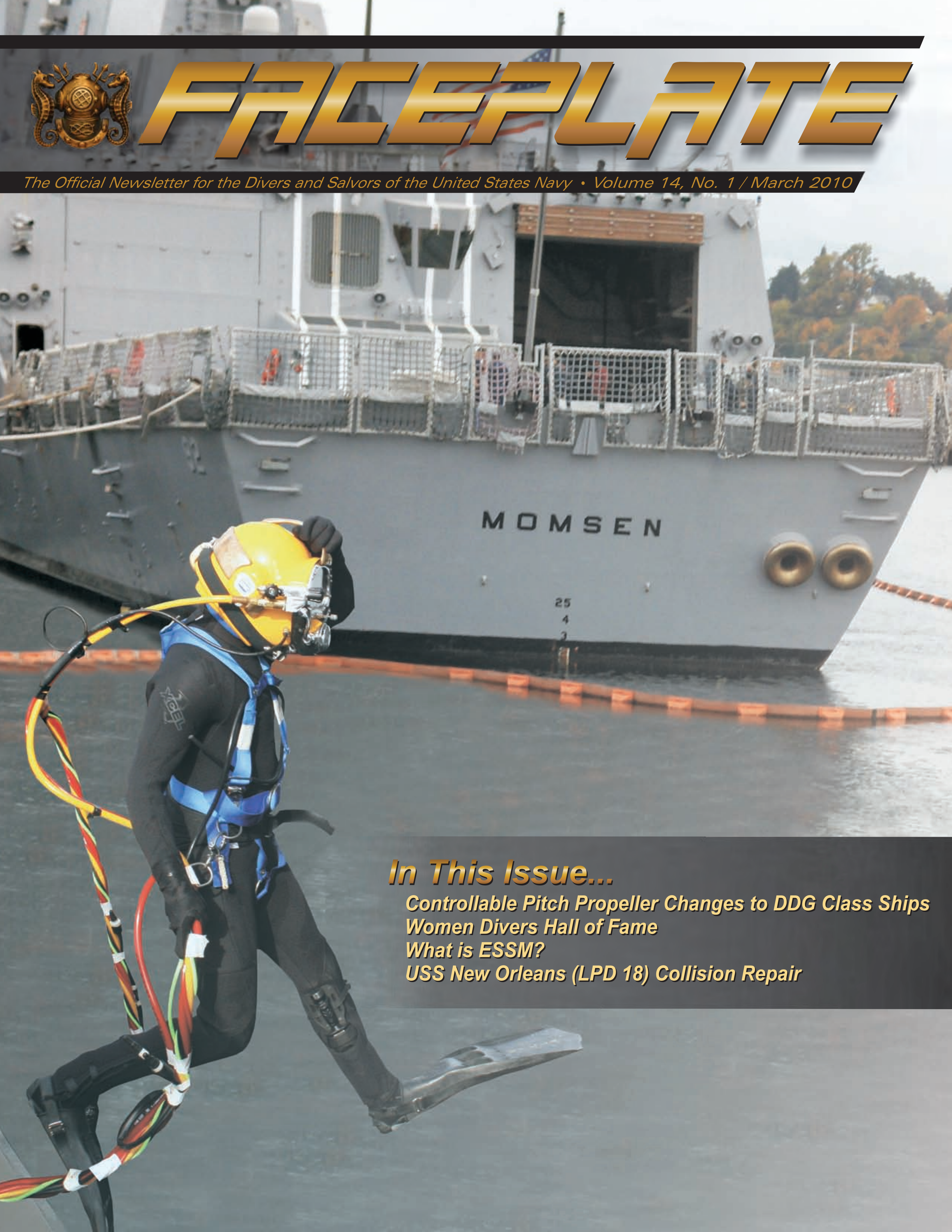

In This Issue...

FACEPLATE

FACEPLATE is published by the Supervisor of Salvage and Diving to make the latest and most informative news available to the Navy diving and salvage community. Discussions or illustrations of commercial products do not imply endorsement by the Supervisor of Salvage and Diving or the U.S. Navy.

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Editorial Staff

In This Issue

Cover

U.S. Navy Diver enters the water to torque blade bolts onboard USS MOMSEN.

SUPSALV SENDS ...CAPT Pat Keenan

In our last Faceplate, I listed some examples of recent accomplishments by Divers and Salvors throughout the Navy. In this issue I will provide you with a status of our community by the numbers. It is instructive to see how many Navy Divers are on duty and how much diving you do.

On the enlisted side, there are currently 1,164 Navy Divers (ND rating), 108 Seabee Divers, 1,015 EOD Technicians, and 2,036 SEALS on active duty. For those of you with a statistical bent, our 88 Master Divers represent less than eight percent of the enlisted diving (ND) community. To you young Divers aspiring to be Masters some day, the numbers reveal that this is a significant challenge, but no worthwhile goal is easy to achieve. Stay focused and keep studying!

Captain Patrick Keenan, USN
Supervisor of Salvage and Diving

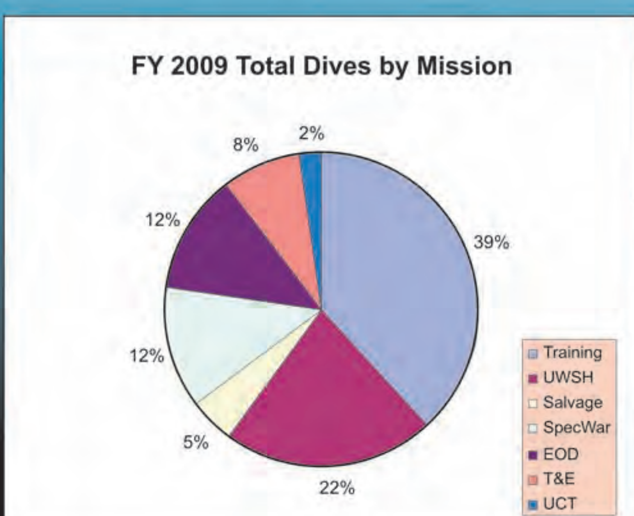
The total number of Officer Divers in all diving communities is approximately 1,160. We are fortunate to have specific Warrant Officer career paths for Divers, EOD, Civil Engineering Corps (UCT), and SEALs. If your goal is to attain a leadership position with a specific technical expertise, you may want to inquire about Warrant Officer commissioning programs. At the top, in recognition of the vital work they are doing, the SEAL and EOD communities now have multiple flag officer billets. The Chief Engineer of our Navy, a Rear Admiral, is an Engineering Duty Diving Officer.

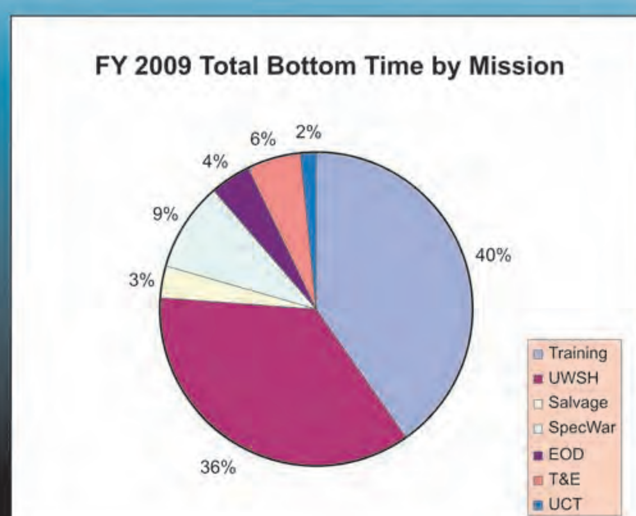
In salvage and ship husbandry, our active duty forces are supported by roughly 50 Navy Divers in various reserve status and 80 civil service Divers who work primarily in industrial facilities.

During FY 2009, U.S. Navy Divers (military and civilian) performed 80,224 dives accumulating 71,699 hours of bottom time. Breakdowns of Navy FY 2009 diving are provided in the following charts. (Note: Data for these charts comes from the DJRS (Dive/Jump Reporting System) and only dives conducted at training commands are categorized as training). Young Divers who are doing the business of keeping our fleet operational or performing salvage, SPECWAR, EOD, and UCT missions should take every opportunity to learn from the experienced, older folks in your lockers. Don't hesitate to ask them questions, but also do not be bashful about making suggestions. Often, the insight on how to best perform a job will come from the junior person on the team who has spent the most time in the water and is closest to the problem.

Dive Supervisors, Master Divers, Warrants and Diving Officers, please remember that one of your primary responsibilities is to teach. The knowledge and experience that you pass along to new Divers will benefit our Navy long after you have moved on.

Keep up the great work. I look forward to seeing you around the fleet.





DDG Blade Bolt Inspection

By: LCDR Joshua LaPenna, USN

What do you do when the Controllable Pitch Propeller (CPP) system blade bolts on 19 Arleigh Burke Class destroyers (DDG 51) are found to be loose or missing? Answer: You check them all! At 80 bolts per ship this is no small task. DDG 51 Class Advisory 03-2009 requires that all 59 Arleigh Burke class destroyers be inspected to ensure that the material type and torque of each blade bolt are within specification. So what does all of this mean to you? "Divers…Go to work!" That's right, because 42 of these ships are currently planned for in-water inspection/repair. With only 18 months to complete all the inspections, nearly every dive locker will splash on this job.

Knee-jerk reaction? Not at all. Loose or missing propeller blade bolts greatly impact the integrity of the propeller blade-to-hub joint. If left unchecked, this could result in bolt failure and the catastrophic loss of a propeller blade. Such a failure could place the remaining blades and hubs at risk and compromise propulsion. In addition to verifying the material condition of our fleet, the data obtained while performing these inspections will give designers the data necessary to better understand the cause of failure (i.e. loss of preload).

For each inspection a Naval Sea Systems Command (NAVSEA) representative and an Emergency Ship Salvage Material (ESSM) mechanic from the Supervisor of Salvage and Diving (SUPSALV) will meet your dive team at the pier with the equipment necessary to complete the job. As you may have guessed, opening a "can-of-man" and pulling on a socket wrench with a 6-foot "cheater" won't do the trick. To ensure that the blade-to-hub joint is sufficiently tight (in compression), each of the eight 2.25 inch diameter Inconel bolts must be stretched 0.007-0.009 inches. To achieve this "stretch", up to 3,500 ft.-lbs. of torque (nominal) must be applied to each bolt. For this reason a hydraulically powered Hytorc wrench must be used. In conjunction with torquing the

HYTORC wrench hydraulic pump.

bolt, ultrasonic equipment is used to simultaneously measure the actual stretch of the bolt. At a minimum, each of the 80 bolts will be torqued twice. The first torque sequence (2,350 ft.-lbs.) ensures that the bolts have not loosened beyond the minimum criteria and identifies candidates for material failure. The second torque sequence (3,500 ft.-lbs.) is used to positively torque each bolt to the upper end of the specification. Because clear communications and coordination are necessary between the Divers and topside personnel, the use of MK-21/37 helmets is recommended. To ensure a safe and expeditious inspection, the NAVSEA representative will discuss lessons learned and best working practices with the dive team upon arrival.

Typically, all parties should allocate two weeks for the inspection of a single DDG. This schedule provides additional time to perform the removal, liquid dye penetrant test (NDT) and re-installation of any questionable bolts, as well as minor repairs to CPP seals should oil leaks be discovered during the inspection. If the bolts exhibit sufficient preload, and no new work is discovered, the inspection can be safely accomplished in just three days (~24 hours of diving). Such stellar performance was demonstrated by the Puget Sound Naval Shipyard (PSNS) and Intermediate Maintenance Facility (IMF) Detachment Dive Locker in Everett, Washington. Although the CPP inspection of the USS SHOUP (DDG 86) was originally planned for two weeks, the PSNS & IMF Divers found it feasible to complete the USS SHOUP and the USS MOMSEN (DDG 92), as well as their biannual Diver Operational Readiness Assessment (DORA) during the same period. Hoo-Yah! These two jobs demonstrate the efficiency that results from the proper preparation, and conducting procedural training prior to SUPSALV's arrival.

Figure 1: One of the eight star-headed blade bolts that can be found on all Advanced Technical Design (ATD) blades.

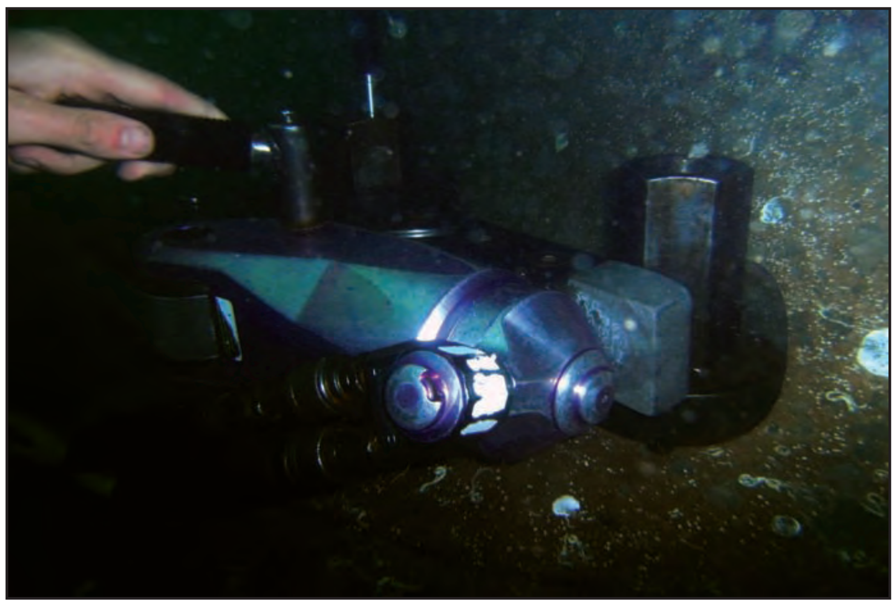


Figure 2: HYTORC wrench and probe set up on blade bolt #6.

Here's a quick visual tour of the job. Figure 1 shows one of the eight star-headed blade bolts that can be found on all Advanced Technical Design (ATD) blades (DDG 52, 79 and follow), the ultrasonic probe (transducer), and the NDT instrument. After the blade bolt caps are removed from the blade, the probe is threaded into the hole on the top of the bolt to be worked. The socket and Hytorc wrench are then placed on the bolt and the NDT instrument is connected to the probe via a simple Marsh Marine type connection. When it's all put together it looks like the configuration in Figure 2. As the bolt is torqued, the stretch (or lack there of) can be observed on the NDT instrument located topside. That's it. This basic sequence is repeated for each and every bolt. Easy day right?! Yeah right!

Article Cover Picture: U.S. Navy Diver exits the water after torquing blade bolts onboard USS MOMSEN.

LCDR Joshua J. LaPenna is a Engineering Duty Officer and a Deep-sea Diver stationed at NAVSEA 00C, working as an Underwater Ship Husbandry Project Manager.

POLLUTION RESPONSE: A KEY SALVAGE ENABLER

By: Stephanie Brown

In today's world of marine casualty response, pollution is almost always incident to salvage operations and requires some form of control or cleanup. The modern day Salvor should understand environmental regulations and know that failing to prevent spills can easily lead to a salvage operation being shut down by officials until corrective action is taken. This can result in significant cost and schedule overruns, not to mention negative publicity. Responders must be cognizant of the potential pollution problems that can occur at a salvage site and prepare by having the right spill response equipment standing by. Predicting worst case discharge scenarios and "most likely" discharge scenarios to develop an adequate response strategy is an integral part of the salvage planning process.

Understanding the regulations is the first step to ensuring your salvage operation is carried out free from environmental hang-ups. First and foremost, federal law requires that oil and hazardous substance spills be immediately reported to the National Response Center (NRC) at 1-800-424-8802 or 202-267-2675 and that immediate, direct action be taken to minimize the effect of the spill upon the environment. Criminal penalties exist for failure to report and properly respond to spills regardless of cause. For a summary of the specific Federal environmental laws and regulations, DoD and Navy policies, refer to OPNAV Instruction 5090.1C, the Navy Environmental and Natural Resources Program Manual, which can be found at http://www.navy.mil/oceans/5090_1C_Manual.pdf (Chapter 12 covers Oil and Hazardous Substances Contingency Planning). Particularly, Fleet salvage forces are instructed to "take all reasonable precautions to reduce the threat of oil and hazardous substance pollution during salvage operations." The state and local environmental laws of a particular salvage site should also be investigated during the planning phase to ensure there are not more stringent requirements or protected areas that could be affected by a spill.

In accordance with OPNAVINST 5090.1C, the Office of the Director of Ocean Engineering, Supervisor of Salvage and Diving (SUPSALV) is responsible for providing technical support and resources to the Navy Fleet and shore establishments under the Oil and Hazardous Substance (OHS) Spill Response Program and is the Navy's response team for Worst Case Discharge (WCD) type spills. SUPSALV may also provide spill response assistance to other federal agencies, upon request of the On Scene Coordinator (OSC).

Pollution response efforts during the Juliett 484 submarine refloating operation in Providence, RI in 2008. Left: Rope mop and sorbent pads used to clean up the boomed-off oil. Right: Protective boom used to contain oil spilled from the submarine.

SUPSALV maintains a large inventory of spill response equipment through its Emergency Ship Salvage Material (ESSM) System, which is a managed network of warehouses strategically located to provide rapid response to Navy incidents. This pre-positioned pollution equipment includes spilled oil recovery gear, casualty offloading tools, and ancillary support equipment such as pumps, hydraulic power units, generators, lighting systems, etc. Experienced field managers, operators, and mechanics can meet the equipment at the site, mobilize the equipment, operate it, and provide for maintenance and demobilization, if necessary. Small boats, deployable field command posts, berthing vans, communications systems, portable rig-

Left: Divers from MDSU 1, SWRMC, and pollution response experts from SUPSALV supporting the U.S. Coast Guard to assess the remaining petroleum products aboard the ex-USS CHEHALIS. Right: Two light weight hot tap systems shown, which will be the type of tool used during the offloading operation.

ging shops, and maintenance shops are available to support the logistical aspects of a salvage/pollution operation as well.

All of this equipment is designed for rapid mobilization via airlift or trucking and most is packaged "ready-for-issue" in ISO 20-foot containers, which do not require wide-load permits for road transport. The "Salvage Support Skimmer System" is a van specially designed to be an all-in-one salvage support container with gear such as boom, small skimmers, an oil mop kit, storage bladders, and even a 15-foot inflatable boat with outboard motor. This usually meets the pollution prevention and response needs of any light salvage operation. A recent salvage operation which made use of this van was the Juliett 484 submarine refloating in Providence, RI during the summer of 2008. Though the casualty was not expected to contain any significant amount of pollutants, once dewatering commenced oil began flooding out. Due to proper planning, a protective boom had been laid and clean-up materials were available onsite and immediately deployed in response to the spill. The spill was properly reported and the Rhode Island Department of Environmental Management official who came to inspect the site was more than pleased with response efforts.

Access to the ESSM equipment is on a cost-reimbursable basis. There is no retainer charge. The SUPSALV website, identified below, may be useful during the salvage planning process. Information such as detailed equipment inventories broken out by location, equipment descriptions, and other system specifications is available at www.supsalv.org/essm/. The ESSM Operations tab provides guidelines for requesting SUPSALV assistance.

Only in recent years has the removal of the pollution hazards become of paramount importance in any salvage operation. Due to this shift, it is imperative that Navy salvors are knowledgeable in the safety requirements of environmentally focused salvage and of handling large quantities of petroleum products. Because of an increasing sensitivity to the environment, removal of a potential source of pollution may be the primary reason for undertaking a salvage operation that would otherwise be bypassed. The problem of potentially polluting sunken shipwrecks from the World War II era has long been discussed and recent incidents around the world have caused government agencies to look proactively at preventing catastrophic oil and other chemical releases from these long submerged vessels.

An example of one of these wrecks that was brought to the Navy's attention in 2007 is the ex-USS CHEHALIS (AOG 48), a PATAPSCO class gasoline tanker that sank off the coast of American Samoa nearly 60 years ago. The people of American Samoa were concerned about the potential source of pollution in their pristine fish and wildlife environment. Since then, the U.S. Coast Guard tasked the Navy to assist in surveying the wreck to estimate the amounts of petroleum products remaining aboard and has now moved into planning the offloading phase of the operation for early next year.

Left: Oil leaking from the USS MISSISSINEWA, prior to patching efforts in 2001.
Middle: Divers removing hot tapping assembly from the MISSISSINEWA's inverted hull during the oil removal operation in 2003.
Right: Mk 21 helmet covered in oil following a dive in the #4 starboard tank of the MISSISSINEWA.

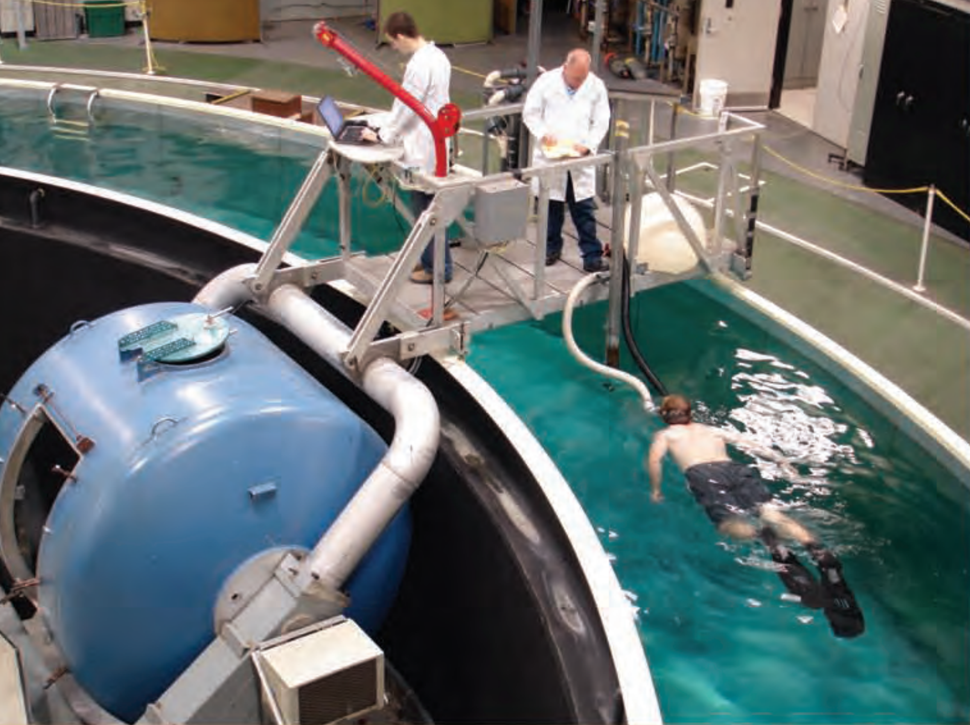
Continued on pg.28

ANU Submissions 2009

By: Robyn McGinn

Item	ANU Item #	ANU Section	CAT	Model #	Manufacturer	Sponsor
COMBATANT DIVER'S VEST (CDV), USMC	1.1.15	Life Preservers	I	P/N 769171 (W/ CYL), 769176 (W/O CYL)	Aqualung (US Divers)	Marine Corps System Command (MARCORSYSCOM, PM RAR)
DIVATOR MK II UNDERWATER BREATHING APPARATUS & DP1 SURFACE SUPPLY SYSTEM	1.3.20	Cylinders, Manifolds, and Backpacks, SCUBA	I	Divator MK II & DP 1	Interspiro	Mobile Diving and Salvage Unit (MDSU) 1&2, Underwater Construction Team (UCT) 1&2
COMBAT DIVER FULL FACE MASK (CDFFM), USMC	1.6.5	Regulators, Special Service Full Face Mask	I	P/N 805-165	Kirby Morgan Dive Systems Inc.	Marine Corps System Command (MARCORSYSCOM, PM RAR)
COMBAT SWIMMER'S HARNESS (CSH)	1.7.9	Special Accessory Items	I	P/N 495506	Aqualung (US Divers)	Naval Special Warfare (PMS NSW)
COMBAT DRY SUIT	2.2.14	Dry Suits	III	Viking Combat Dry Suit	Trelleborg Viking, Inc.	Special Operations Command (SOCOM)
TRANSPORTABLE RECOMPRESSION CHAMBER (TRCS) ILLUMINATION SYSTEM	3.5.2	Diver Battery Powered Lights, Helmet and Handheld	II	MDL 3000 Generation II (LED bulbs only)	Hydrotech Enterprises	Naval Special Warfare (PMS NSW)
AQUACOM MK-IV 3 DIVER INTERCOM	3.6.15	Communications Systems and Accessories	II	MK IV	Ocean Technology Systems (OTS)	South West Regional Maintenance Center (SWRMC)
KM EAR & MICROPHONES (SUPER MIC)	3.6.16	Communications Systems and Accessories	II	Band Mask Communication System (KM Ear/ Microphone)	Ocean Technology Systems (OTS)	Naval Diving and Salvage Training Center (NDSTC)
GAS BOOSTER PUMP & CHARGING CASE	5.1.7	H_EO_2, O_2 Pump Transfer Systems	I	P/N HS-121055M2 & HS-032628M2	Highstar Industrial Technologies	Naval Special Warfare (PMS NSW)
UNDERWATER POWER ACTUATED STUD GUN	9.3.58	Tools	II	UW10	Hilti North America	South West Regional Maintenance Center (SWRMC)
UNDERWATER TELEVISION SYSTEM	9.2.23	Photographic and Video Equipment	II	UWS-3210, UWS-3210D	Outland Technology, Inc.	Portsmouth Naval Shipyard (PNS)

Justification for ANU Inclusion	Equipment Description
USMC sponsored the CDV as a phase replacement for the SECUMAR Life Preserver. The CDV is a modified Combat Swimmer Assault Vest (CSAV), providing increased capability.	The CDV is a highly adaptable multi-mission/multi-apparatus diving vest used by Marine Combatant Divers that provides buoyancy control during the dive as well as head out/ face up flotation for an unconscious or conscious diver on the surface. The CDV consists of an adjustable load harness that weaves through and attaches to a split horse collar shaped outer container/ air bladder. The CDV is donned like a jacket and closes in the front with side release buckles.
The sponsoring commands had an operational need for more portable lightweight diving equipment that was capable of rapid deployment to remote locations. The Divator MK II and DP 1 provide increased air storage capacity with lighter weight than conventional SCUBA. These attributes allow for more operational flexibility in particular support craft selections.	The lightweight DP 1 surface supply diving system offers more flexibility to operate either as a stand alone SCUBA or augmented by additional SCUBA cylinders which provide air through a dual use HP hose/strength member which extend bottom time, increase diver safety with a redundant air source, and support deeper dives than traditional SCUBA. The DP 1 has two high pressure supply cylinder connections, which each are connected to a high pressure supply cylinder or cylinder pack. A shuttle valve allows the attendant to change the supply cylinder or cylinder pack during diving operation.
USMC sponsored the CDFFM as a modified version of the KMS 48 Full Face Mask. Modifications provide more durability, improved comfort, and a wider field of vision without altering functional capability.	The CDFFM has a larger viewing cavity that is closer to the face and than the KMS 48. The original KMS 48 had a single viewing lens, while the CDFFM uses two separate lenses, increasing the overall field of vision by 25%. To accommodate the larger viewing cavity, the face seal had to be changed. Also, a new head harness was developed which has three different buckle options (two types of plastic, one brass black oxide coated). The lower cavity component remained the same as the original KMS-48.
PMS NSW sponsored the CSH for use as an alternate harness with the MK25 MOD 2 during combat swimmer missions. The CHS is standardized to better fit the operator.	The CSH was specifically designed for the Special Operations Force Combat Diver. The CSH integrates and streamlines the wearing of underwater breathing apparatus (UBA), diver weights and mission specific gear. The harness is adjustable to fit a large range of body shapes and sizes.
The Viking Combat Dry Suit was placed on the ANU list in order to provide another dry suit option for divers.	The Viking Combat Dry Suit is made of black EPDM/natural rubber with a flexible polyamide/elastene lining. The suit is equipped with rotating inlet and exhaust calves and a medium duty zip. Black rubber reinforcements are also integrated on the suit, covering the lower front leg over the knee and across the shoulders.
PMS NSW sponsored the TRCS Illumination System because there were no ANU approved external light sources identified for the TRCS. It was pointed out that this item could also potentially be utilized as an emergency light on other chamber systems.	The TRCS Illumination System 3000 Gen II is a portable suitcase chamber lighting system consisting of two portable light fixtures on brackets that allow the lights to be positioned above the chamber view ports. The lights can be used one at a time or together by use of the storage battery. Only LED bulbs are authorized (vice Halogen bulbs) as to limit the heat exposure to the viewports.
SWRMC sponsored the Aquacom MK-IV as an alternate to the Hydrocom Underwater Communication System, model HCOM 1001000 (ANU item 3.6.1), which is no longer manufactured. The MK-IV provides more durability, requires less maintenance and is easier to repair (mainly because repair parts are more readily available).	The Aquacom MK-IV 3-Diver Intercom allows open "round robin" communications through intercom lines among a surface tender with a headset and up to three divers with earphone/microphone assemblies. All users can speak and listen simultaneously, without the need for a push-to-talk system.
NDSTC was experiencing high failure rates of the Kirby Morgan communication systems in the MK21 and KM37 (85 ear sets & 60 microphones in 12 months). The OTS KM communication system was sponsored because it is completely sealed and lasts longer than the existing communication systems. They were considered more durable, more reliable, and less expensive to maintain over the life of the system.	The OTS KM Ear/Microphone system is a piezoelectric design being utilized to replace earphone and microphones for the Kirby Morgan helmet and band masks. They are waterproof, rustproof, and floodable, lasting longer than mylar earphones.
NSW sponsored the Highstar Gas Booster and Charging Case because it was lighter in weight and more durable by comparison to similar ANU items.	The Gas Booster and Charging Case was specifically designed to support NSW commands in the charging of MK-16, MK-25 and breathing oxygen bottles. It incorporates Haskel oxygen booster pump, Type 15/20 (MDL 28007), relief valves, regulators, and pilot switches; these are the same components utilized within the ANU approved 26968 and 55016 pump assemblies, but piped differently in order to fit within a Pelican case.
SWRMC sponsored the Hilti Stud Gun as an alternate for the Ramset 2000, which is currently on the ANU list but no longer in production. The Hilti UW10 Stud Gun enhances capabilities by offering a multi shot capability versus the single shot Ramset unit.	The UW10 Hilti Stud Gun is a high-performance, high velocity power-actuated tool which was designed especially for ship repairs. The UW10, which can be fired above and below the water, is primarily utilized to nail patch plates over areas where a ship has been damaged.
PNS Divers sponsored the UWS-3210 & UWS-3210D as an alternate for the UWS-3010 (ANU item 9.2.20) which is not longer manufactured. The UWS-3210 series is the next generation of underwater televisions from Outland Technologies, providing more durability and requiring less maintenance.	The UWS-3210 provides a camera and light (via umbilical) for one diver while the UWS-3210D provides cameras and lights (via umbilical) for two divers. It's highly portable in a case configuration with AC power and internal electrical protection.



Improve Your Exercise Stamina by Training Your Breathing Muscles

By: C.E.G. Lundgren and D.R. Pendergast

Navy missions often require demanding exertion which, depending on the tactical situation, may range from an "explosive" short-term effort to long lasting activity. These efforts are mostly dictated by the need for locomotion, that is, to move a certain distance running on land or swimming at or below the surface. A special case is presented by the need to move at high altitude. All these conditions pose marked challenges to breathing. These challenges are due to the need to ventilate the lungs while often using breathing gear that causes increased work of breathing as does the breathing gas when inhaled at increased pressure. Likewise, swimming at the surface requires inhaling against a hydrostatic pressure on the chest which is higher than the air pressure in the lungs and breathing at altitude, where the oxygen pressure is low, necessitates a larger lung ventilation than at sea level.

The idea

This article describes how specific training of the breathing muscles can greatly increase your ability to perform Sustained Submaximal Exercise (SSE) of the kinds mentioned above. In our laboratory the respiratory muscle training (RMT) is performed in two complementary ways, one increasing the strength of the breathing muscles and the other their endurance. We refer to the strength training as resistance respiratory muscle training (RRMT) and to the other as endurance respiratory muscle training (ERMT). In a publication referring to the effects on the respiratory muscles of these two types of training Drs. D.H. Leith and M. Bradley (a former Navy researcher) referred to trainees becoming "respiratory weight lifters" or "respiratory marathoners". However, it was Dr. U. Boutellier and coworkers who, using ERMT first in sedentary subjects and then in competitive bicyclists showed that breathing muscle training could improve SSE, regardless of the initial physical fitness of the subjects.

How RRMT is done and the results

For RRMT a small mouth piece assembly is used. It has one spring loaded valve on the inspiratory side and one on expiratory side (Fig.1A), both with opening loads of 60 cm (~ 24 inches) of water. A training session consists of taking a full inspiration followed by a complete expiration every 30 seconds (paced by a metronome) for a total duration of 30 minutes. This is repeated once per day, 3 days per week for 4 weeks. The training result can then be maintained by doing only 2 training sessions per week.

The ERMT is performed with the same breathing device to which a rebreathing bag has been added and the valve springs have been changed to offer a minimal resistance (Fig. 1B) The rebreathing bag and function is similar to that of the "drop-down" mask and bag used in airplanes to supply oxygen during emergencies. For ERMT use, the breathing bag volume, which is adjustable, is set at ~ 60% (say 3.0 liters) of the trainee's vital capacity (the largest breath he can take); a metronome is set to signal for a breath to be taken every two seconds. Breathing on the mouth piece the trainee will be taking 30 breaths per min in and out and with a breath volume that somewhat exceeds the bag volume (say by about 0.2 liters). The breaths in and out will automatically exceed the bag volume somewhat so as to open the valves towards the end of inspiration and expiration and provide sufficient oxygen supply and carbon dioxide elimination. It happens without the trainee's noticing it and is due to the body's normal sensitivity to carbon dioxide. In this example, he/she will be breathing a total of 3.2L x 30= 96 L/ min. This intense breathing is carried out for 30 minutes each day, 3 days a week for one month. For beginners, a ventilation of 90-100 L/min is usually the most they can sustain for the entire 30-minute training period. This lung ventilation corresponds to the breathing during heavy exercise. Yet, the oxygen consumption and therefore carbon dioxide production are only slightly higher than during resting. The modest increase in oxygen and carbon dioxide exchange is due to the heavy work imposed on the relatively small breathing muscles (the big muscles in legs and arms are still resting). The role of the rebreathing bag is, as the name implies, to "give back" during inspiration some of the carbon dioxide that was expired in the preceding breath. This prevents too low a carbon dioxide level in the brain and protects against the dizziness that would be experienced if one were hyperventilating without having the carbon dioxide production that calls for the large ventilation during whole body exercise. A further improvement of the training effect on the respiratory muscles is achieved by, each training day, increasing the breathing frequency by one breath per minute. Thus, for instance, the total ventilation on the 10th training day would be 3.2L x (30+1x9) = 124.8L/min (versus 96L/min the first day). When the breathing frequency becomes uncomfortably fast, it can be reduced by increasing the rebreathing bag volume setting which allows the frequency to be reduced while achieving the same or increased training ventilation. This method has, during the four-week training protocol, allowed our trainees to reach ventilation levels more than double what they could sustain when they started the training.

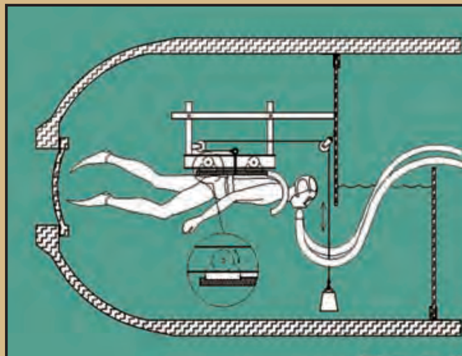


Figure 3

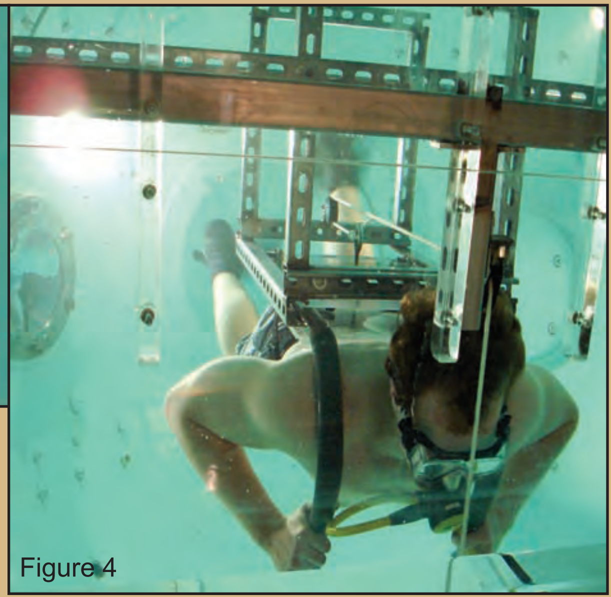


Figure 4

The testing of SSE was performed before and after respiratory muscle training. It was done at our center, both at the surface in the 60 meter circumference pool (Article cover photo) and submerged at different depths in the dive chamber (Figs. 3 and 4). The level of exertion in the pool is set by a traveling light signal at the bottom, which the swimmer has to keep up with. The speed of the moving light and the diver can be controlled to require any desired percentage of his maximal oxygen consumption. In the chamber, the control of the swimmer's oxygen consumption is achieved by an adjustable weight and pulley system that the diver swims on so as to keep the weight off the bottom (Fig. 3). The diver's ability to sustain a certain SSE is measured as the time he is able to keep the weight off the bottom. The tests of SSE during running were performed in a treadmill at a speed and up-hill tilt also requiring a certain submaximal oxygen consumption. The same approach was used in the altitude chamber altitude, although the exercise load was, for space reasons, imposed by an exercise cycle. The altitude, simulated by partial evacuation of the chamber, was 10,000 feet.

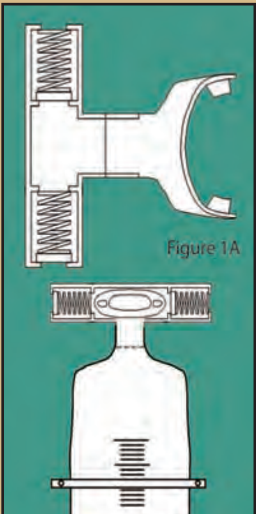


Figure 1A

Figure 1B

Results

The reason for performing these tests at submaximal effort is that that effort is in the range (60-85%) of maximal oxygen uptake where most Navy activities requiring exertion are likely to be carried out. Our 4-mile speed test (not being a typical endurance activity) was performed at an exertion level of 95% of the runners' maximal oxygen uptakes. All the other tests were made at an average of about 75% of maximum (range 70-80%). This relatively high exertion level was chosen to put the effect of RMT to a more severe test than would have been posed by using an exertion level of only 60% of maximum. SEALs are typically trained to swim at a speed of one knot, requiring 60% of maximal oxygen uptake which can usually be sustained for about 3 hours. Assuming no "head or tail" current, this would, for instance, mean that the swimmer has to be deployed from a swimmer delivery vehicle at a distance of 1.5 nautical miles from a mission target if, without prior rest, he will be required to swim an equal distance returning. By contrast, when respiratory muscle training has increased the time he can continue to swim by 50- 85% (depending on depth, see Table I and Fig. 5) the deployment distance could be increased to between 2.3 and 2.8 nautical miles. Another way of looking at these advantages is that we have found that when swimmers, who have not done RMT, give up due to exhaustion caused by fatigued breathing/locomotor muscles, divers who have done RMT can cover the same distance with much less breathing and locomotor muscle fatigue. In other words, they are in better condition and can continue swimming or perform land based exertion such as running. Alternatively, the RMT trained diver can sustain a higher (submaximal) exercise level, i.e. swim faster, and arrive at the target in a shorter time. Increased speed has been demonstrated by our elite runner subjects who, on the average, shortened their 4 mile running time from 29 min to 27 min and two of the trainees, who were marathoners, cut their times by 10 and 15 minutes, respectively. Similarly, higher speeds have been obtained after RMT by cyclists and rowers.

Another important gain from RMT, and part of the reasons for the improvements mentioned above, is that the ventilation and oxygen consumption of the divers were lower after RMT at the same exercise effort. This would not only save oxygen and breathing gas when on open circuit gear, but could reduce the risk of oxygen toxicity by reducing the exertion during swims. Another potential issue for divers is that it has been shown that they either voluntarily or due to circumstances, under-ventilate (hypo-ventilate) to save gas and over a period of time develop an insensitivity to the increased CO_2 that results (they become CO_2 retainers). Our studies have shown that RMT can "normalize" CO_2 sensitivity while sustaining a low ventilation and CO_2 production.

Table I. Performance times (averages) before and after RMT

Condition	Pre-RMT	Post RMT	Improvement	
	Minutes	Minutes	Minutes	%
(1) Running				
(a) Treadmill				
ERMT, 5 d/wk	38.0	79.1	41.1	108
(b) 4 Miles				
ERMT, 5 d/wk	29.8	27.6	(-) 1.2	4
(2) Cycling, Stationary				
(a) Sea Level				
ERMT, 5 d/wk	12.5	22.1	9.6	77
(b) 10,000 ft of altitude				
ERMT, 5 d/wk	14.0	23.2	9.2	66
(3) Fin Swim, Surface				
RRMT, 3 d/wk	25.5	38.3	12.8	
RRMT, 5 d/wk	32.0	42.3	10.3	
ERMT, 5 d/wk	35.4	48.9	13.5	
(4) Fin Swim at Depth, Stationary				
(a) 4 ft. of Depth				
RRMT, 3 d/wk	25.5	48.0	22.5	88
(b) RRMT, 5 d/wk	19.0	31.6	12.6	66
(c) ERMT, 5 d/wk	20.3	25.7	5.4	27
(d) 55 ft. of Depth				
RRMT, 5 d/wk	31.3	49.9	18.6	60
(e) 120 ft. of Depth				
RRMT, 5 d/wk	26.4	49.4	23.0	87

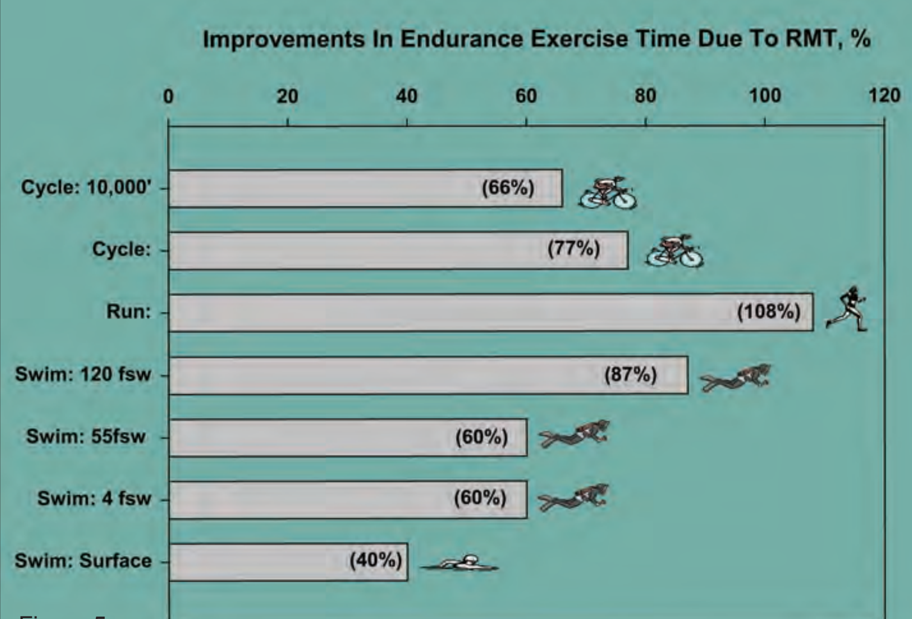


Figure 5

How does RMT work?

It is worth noting that some studies have found only small or non-significant effects of RMT on exercise endurance. It is clear that these studies suffered from deficiencies in training methods and/or the testing protocols. These studies tested the trainees' exercise endurance a day or two after the series of RMT had been completed. That early, after vigorous RMT, the breathing muscles are still tired from the training which hides much of the beneficial training effects. It is no more surprising than that, if somebody does a training marathon run the day before a competitive run, his/ her time in the competition will not be very good. When we tested our runners the day after the end of a month long series of ERMT bouts there was a 29% improvement in exercise endurance while, when the test was repeated five or seven days later there was an additional 50% improvement (for a total of 79%), (Table I). Other reasons for faulty results are that compliance with the training schedule has not been assured, or that the training devices or protocols have not been adequate, which contrasts with the studies showing improvement,

RMT will, as mentioned earlier, not only improve a sedentary person's ability to sustain submaximal exercise but has also been shown to be quite effective in physically well trained persons like competitive runners, swimmers, and rowers. The reason that physical training such as regular 5-mile runs does not maximally enhance running endurance is that the training runs typically are performed at less than 75 % of the person's maximal oxygen uptake. At that level of work-out the exercise ventilation is less than half of the maximal ventilation that the person can achieve. As the run proceeds past 5 miles, the breathing muscles gradually become fatigued. It is common that the runner slows down or stops, not because he/she feels that the breathing muscles are tired but because the leg muscles feel heavy and fatigued. This can be explained by the fact that, as the breathing muscles work during the run, they accumulate lactic acid which gradually increases the blood flow through them.This increase in blood flow is achieved at the expense of the blood flow through the leg muscles which then give up (this is known as the "stealing" phenomenon). The effect of

the RMT is to increase the respiratory muscles' strength and efficiency (less oxygen needed for a given muscle effort) and therefore a greater share of the total blood flow from the heart can be delivered to the leg muscles and delay the exercise fatigue. To try, as an alternative to RMT, to train the breathing muscles by running so hard as to achieve maximal ventilation will cut the run short because of insufficient blood flow from the heart and this will stop the runner before the breathing muscles have time to reach a ventilation level that is sufficiently high to effectively strengthen them.

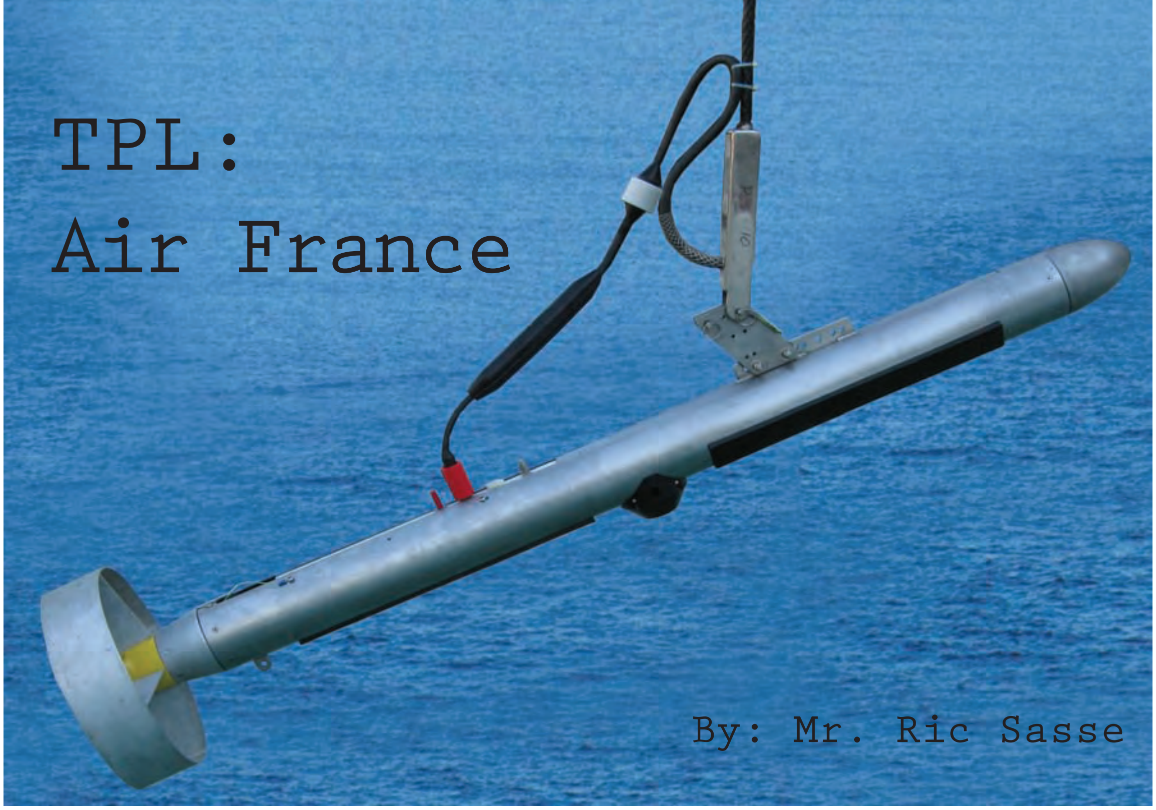
Why is RRMT more effective for exertion at depth than ERMT and why does the latter type of training show somewhat better effects when swimming at the surface (Table I, Condition 3c compared to 3b)? The ventilatory work that the breathing muscles perform at depth is considerably higher than at the surface because, during submersion, the work of breathing is very high due to flow resistance in breathing gear and the effect of high gas density both on the gear and the lungs. Hence the marked benefit of RRMT when the Divers were submerged (Table I, Conditions 4 a, b and d). It is noteworthy that the effects of RRMT performed 5 days/week, when tested on swimming endurance, were less effective than when the RRMT was limited to 3 days/week (Table I, Conditions 3b and 4b compared to 3a and 4a). A likely explanation is that the 5 days/week schedule caused what is known as "over-training" in sport physiology. The advantage of ERMT over RRMT for surface swimming may be that the surface swimmer's lung ventilation depends more on sustaining a rapid ventilation for which the ERMT is a more appropriate breathing pattern. Thus, the "respiratory marathoner" excels at the surface and the "respiratory weight lifter" at depth. Nonetheless, both forms of training confer marked advantages in both kinds of pressure environments (Table I, Fig. 5), (note that only ERMT has been tested so far in runners and at altitude (where an exercise cycle was used).

From the point of time saving, it is noteworthy that the performance improvement (gained after 4 weeks of 3 training sessions/week could be preserved for months on end by only 2 training sessions per week (Fig. 5). Maintenance of the 88% gains in swimming endurance obtained in Condition 4a was preserved at over 80% when RRMT was performed only 2 days/week and the effect retested once each month over three months.

A particularly attractive aspect of RMT is that it can be performed in an indoor setting with minimal space requirements (e.g. in a submarine) and, since it can be done in the sitting position, some trainees have found that it can be combined with other moderately demanding activities such as watching TV or even reading. Moreover, preliminary observations suggest that RMT hastens recovery of fitness when recuperating from injury or illness.

Dr. Lundgren is a State University of New York Distinguished Professor Emeritus and Dr. Pendergast is Professor of Physiology and Biophysics at the Center for Research and Education in Special Environments (CRESE), School of Medicine and Biomedical Sciences, University at Buffalo, NY.

TPL: Air France



By: Mr. Ric Sasse

What is a TPL? It is a Towed Pinger Locator system… A hydrophone towed at depth used to detect and localize the acoustic signal from underwater beacons (pingers) that are commonly attached to commercial and military aircraft. It is an important tool that assists accident investigators in finding aircraft and critical components that are lost in the ocean. The first TPL was designed for the USN in 1976. Currently, the Navy maintains two TPL systems capable of worldwide deployment on short notice. The U.S. is the only country that actively maintains this capability and is often requested by other countries to assist, such as: Indonesian Adam Air KI-574, Australian H60 Blackhawk near Fiji, and Air France 447 in Brazilian waters. A TPL acoustic search is roughly 8 times faster than a comparable side-scan sonar search.

The 'pinger' is designed to survive fire, impact, and pressure associated with an overwater aircraft accident. It is saltwater activated emitting a 37.5 kHz chirp every second with a minimum battery life of 30 days. All commercial passenger aircraft have at least one mounted to the flight data recorder (blackbox) and many military aircraft from H-60 Blackhawk helicopters to F-18 Super Hornets have them as well.

Surface and diver handheld pinger locating devices have been successfully used to triangulate pingers up to a depth of 1,000 feet and can hear an active pinger (without triangulation) to a depth of 2,400 feet. But a TPL is the best method and the only method for deeper depths.

Being a towed system, the TPL has the ability to get closer to the acoustic signal, down below the thermocline and away from the ambient surface noise, significantly improving performance. The TPL consists of three sub-systems: the towed body (towfish), the winch with cable, and the surface electronic components. The system can be flown anywhere in the world and mounted on a vessel-of-opportunity (VOO) to conduct a search within the 30 day active window of the pinger.

The TPL acoustic detection range is 2,000 meters and greater depending on environmental conditions. The towfish are 20,000 foot rated and are depth limited only by the amount of cable. A typical deployment has a winch with 22,000 ft. of cable. At tow speeds of 1 to 3 knots, using a cable out scope of 2.5 to 1, provides an effective bottom depth of 13,500 feet. At these greater depths with over 6 km of cable out, turns can take up to 10 hours.

To localize the pinger, the TPL is deployed and parallel search lines are towed. Once the pinger is heard, the operator monitors signal strength and plots the location associated with the highest value. Then a reciprocal line is towed with that line's highest signal strength also plotted. Next, a perpendicular line is towed between the highest signal strengths of the first two lines. This is followed by another reciprocal on this new line. The four highest signal strengths define the box where the pinger is and normally provides enough resolution to capture a side scan sonar image of the wreckage on the first or second pass. Additional TPL lines can be towed to provide higher triangulation if necessary.

The TPL-20 is an analog system sending power down two conductors to an omnidirectional hydrophone with the acoustic signal returning along the same copper pair. Every three seconds a pressure transducer transmits the depth of the towfish. The towfish electronics are contained in a one atmosphere stainless steel housing mounted on the underside of a triangular fiberglass depressor wing to provide hydrodynamic stability. The topside is a standalone electronics console with audio speaker, depth gauge, signal strength meter, and multiple acoustic gain and filter settings.

The newer TPL-40 is a digital system using fiber optics to achieve a higher bandwidth of data. The towfish has an omnihydrophone plus three directional transducers along with improved telemetry of pitch, roll, heading, and depth. The towfish's pressure tolerant electronics are packaged in light weight oil filled cavities, eliminating the need for a pressure housing, and placed inside of a free-flooding torpedo shaped towbody. A laptop with a spectrum analyzer is used for topside control to assist the operator in detecting the pinger signal.

The French Government requested assistance searching for Air France 447, an Airbus A330 lost June 1, 2009 en route from Rio de Janeiro to Paris. In response, the USN Supervisor of Salvage & Diving (SUPSALV) shipped both TPL systems from Dulles, VA to Natal, Brazil aboard a commercial DC-10. The systems were mobilized on board two anchor handling tug vessels, the Fairmount Expedition and the Fairmount Glacier. During the 26 day period from June 15 through July 10 both vessels combined to search an approximately 60 nautical mile by 60 nautical mile box.

No pinger was heard and the wreckage for Air France Flight 447 was not found despite the best efforts of several countries. Even so, this search represented several accomplishments for SUPSALV: This was the first time two independent TPL systems were deployed simultaneously, the area covered of 3,500-nm^2 is a record and orders of magnitude greater than a normal search, and both systems had an operational up time of 94% over the 26 days of searching.

The TPL-40 proved its mettle by surviving an impact with the bottom and continued the search once repairs were made onboard the vessel. The TPL-20 towfish was lost when its cable parted during end of mission recovery. Since then, a replacement towfish has been built from spare parts returning the TPL-20 to ready-for-issue status.

Based on lessons learned from the AF447 search, a new version of the TPL is being designed to combine the best elements of the TPL-20 and TPL-40 into a new and improved single design system. Efforts are still ongoing to find AF447.

Mr. Ric Sasse is the Deep Ocean Search & Recovery Program Manager for NAVSEA 00C.

TPL Search Vessel

TPL Search Vessel After Deck

Loading Equipment on Aircraft

2009 DIVE SCHOOL GRADUATES

09-10-MEDO *(Navy)*

Ms. Stephanie Brown
LT Chris Addington
LT Will Sumsion
LCDR Chris Williams
LT James "Kip" Wilkins
LT Andy LaValley

Congratulations to A2C, CG2C, and UCTB graduating classes as well.

09-70-2C/DMT

LT John Winsley
ND2 Samuel Elliott
ND3 Anthony Russo
ND3 Jason Myers
ND3 Andrew Bui
ND3 Corey Baker
ND3 Richard Macken
ND3 Thomas Barr
ND3 Christian Sapp
ND3 Will Rawls
ND3 Matthew Stromberg
ND3 Johnathon Miranda
ND3 Adrian Wisnieske
HM3 John Connely
HM3 Nolan Myer
HM3 Vladimir Link
HM3 Philip Doyle
HM3 Nathaniel Largent

To submit a graduating class for publication in Faceplate, please contact us at webdiver@supsalv.org Thanks!

USS MOMSEN (DDG 92)

USS MOMSEN is the 14th Flight IIA ARLEIGH BURKE class guided missile destroyer and the Navy's first ship to honor Vice Admiral Charles Bowers "Swede" Momsen, who is best known for his efforts in the successful rescue of 33 crew members and the subsequent salvage of submarine USS SQUALUS after she sank in 240 feet of water in May 1939. He received a commendation from President Franklin D. Roosevelt for these actions.

Charles Bowers Momsen was born in Flushing, Long Island, New York, on 21 June 1896. He attended the U.S. Naval Academy, graduating with the Class of 1920 in June 1919. Following initial service in battleships, he was trained as a Submarine Officer and commanded three submarines in 1923-27. Following those commands, Momsen was assigned to the Bureau of Construction and Repair. In 1929-32 he was actively engaged in the development of a submarine escape breathing apparatus that came to be known as the "Momsen Lung".

During the remainder of the 1930s, he held positions in submarines and surface ships and was in charge of Navy Experimental Diving. In 1939, Commander Momsen was involved in the salvage of the sunken submarine USS SQUALUS (SS 192). During World War II, he led two Submarine Squadrons, including service at sea as a "Wolf Pack" commander, and held other important staff and training positions. Captain Momsen was commanding officer of the battleship USS SOUTH DAKOTA in December 1944 - July 1945. During 1945-51, Rear Admiral Momsen administered the Japanese merchant marine, was Commandant of the Naval Operating Base at Guam, served on the Navy's General Board and was Assistant Chief of Naval Operations for Undersea Warfare. In May 1951, he took command of the Submarine Force, Pacific Fleet, holding that position until June 1953, when he became Commandant of the First Naval District. He was Commander, Joint Task Force Seven from April 1954 until September 1955, when he retired with an increased rank on the basis of combat awards. Vice Admiral Charles B. Momsen died on 25 May 1967. *Source http://navysite.de/dd/ddg92.htm*

Letters to the Editor

FACEPLATE appreciates feedback on our entire publication. So if you want to sound off about something we have published, please do!

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under 'Publications' click on 'Letters to the Editor'

Women Divers

By: CAPT Bobbie Scholley, USN (Retired)

Okay, after 24 years working with Navy Divers, I think I know how you think. And your first question is going to be "Women Divers Hall of Fame? What is it? And is there a Man Divers Hall of Fame?". And then you're going to ask, "Why do I care about the Women Divers Hall of Fame?" Well hopefully I can answer all those questions and provide a little bit of a perspective of the diving world outside of Navy Diving. I'm a member of the Women Divers Hall of Fame (WDHOF) and since retiring from the Navy, I'm now the President of WDHOF. That won't surprise any of you who have worked with me in the past and know how bossy I can be. However trying to lead 166 women Divers is quite a bit different than leading Navy Divers, it's actually much harder!

What is WDHOF? The Women Divers Hall of Fame is an international non-profit professional honor society whose member contributions span a wide variety of fields including: The Arts, Science, Medicine, Exploration & Technology, Marine Archeology, Business, Media, Training & Education, Safety, Commercial & Military Diving, Free Diving, and Underwater Sports.

WDHOF was created in 1999 and incorporated in 2001 by six founding sponsors: Beneath the Sea, Inc., the Underwater Society of America, the Women's SCUBA Association, Women Underwater, Hillary Viders, Ph.D., and Capt. Kathy A. Weydig; WDHOF, Inc. was granted its 501(c)(3) status in 2002. See WDHOF's Mission Statement. The members of WDHOF are an elite group that includes the most notable women leaders and innovators in the diving community. It became the goal of its founders to recognize and honor, while raising public awareness of these women's exceptional contributions. There are currently 166 members in the WDHOF, hailing from 29 U.S. states and Territories and 11 countries worldwide. New WDHOF Members are selected on an annual basis. And it's very impressive to note

BTS 2004 Awards Dinner. Pictured (left to right) CDR Lori Yost, CAPT Bobbie Scholley, CAPT Torie Cassano, CAPT Karin Lynn, CDR Rene Hernandez, CDR Gina Harden, and CDR Karen Kohanowich.

Hall of Fame

that of those 166 members, 18 of them are US Navy Divers. See a listing of the US Navy Divers on page 20.

There are many civilian organizations that recognize men and women in the diving community, such as the Beneath the Sea (BTS) Exposition's Divers of the Year, the Academy of Underwater Arts and Sciences' NOGI Award and the International SCUBA Hall of Fame. These organizations having been recognizing leaders in the diving community for decades, including a few women, but it became apparent that they were missing the contributions of numerous women Divers. So the WDHOF founders decided to have a special recognition of "The Best Women Divers of the 20th Century" at the Beneath the Sea Conference in 2000. But it soon became apparent that there were far to many women to recognize all in one celebration, so the original founders continued to work to turn this into a permanent honor society that would recognize new members annually. The WDHOF honor their new members every year during the Beneath the Sea Awards Dinner held the last weekend of March in Secaucus, NJ (http://www.beneaththesea.org/index.html). They will have a special 10th Anniversary Celebration at BTS 2010 that will show case the last decade and highlight all the members' careers.

Where Is WDHOF? There is no physical location that houses a plaque or monument to WDHOF. But each year, the members of WDHOF attend various consumer diving expositions, the DEMA (The Diving Equipment & Marketing Association) show (for diving professionals only) as well as symposiums, conferences, seminars, and special events throughout the United States. These venues allow our members the opportunity to give presentations/seminars about their areas of expertise and allow our members to meet and speak directly with the public. One of the ways in which WDHOF members try to give back to the diving community is through education, including our scholarship and training grant program, lectures, and mentoring.

WDHOF Mission Statement

WDHOF's two-part mission is to:

- Recognize women divers who have made outstanding contributions to the exploration, understanding, safety and enjoyment of our underwater world and
- Support the underwater world and its associated careers by promoting opportunities for women and men in diving through scholarships, internships and mentorship opportunities and a worldwide network of industry contacts.

Scholarships and Training Grants. WDHOF provides educational, mentorship, financial, and career opportunities to the diving community throughout the world. WDHOF awards multiple scholarships and training grants that offer financial and/or educational assistance to individuals of all ages, particularly those who are preparing for professional careers that involve diving. Scholarships and training grants are awarded yearly. Scholarship applications are available online in September, must be submitted by mid-November, and are awarded at the Beneath the Sea Exposition each year. Scholarships range from underwater archaeology; journalism, graphic arts, or photography; and marine conservation to undergraduate marine research internships in marine biology. Training grants include: junior dive training; certified hyperbaric technician; training grant to assist the disabled to dive; marine science, oceanography, or ocean engineering; and dive training. For more information on and applications for the scholarships and training grants, as well as a complete list of previous recipients, visit the WDHOF website at www.wdhof.org.

Why do I care about WDHOF? That's the hardest question. After 24 years in the US Navy, I was very surprised to find out that there was a huge civilian diving community out there that I knew very little about. There are hundreds and hundreds of Divers that are doing incredible things in the underwater world that I had never even heard of. In this age of outsourcing and teaming with other agencies, it's important to realize that we aren't the only professionals in town. In WDHOF alone, there are Divers who are the legends such as Zale Parry, the first women skin Diver (who also happened to be the female diver in the TV series Sea Hunt, for those of us who are old enough to remember Sea Hunt) and Dr. Sylvia Earle, a reknown marine biologists who led the first team of women aquanauts (Saturations Divers) in 1970 and holds the record for solo diving to 1,000 meters. Then there are the leaders in Equipment and Commercial Diving, such as Connie Lyn Morgan (who many of you know), the President of Kirby Morgan Dive Systems,

The WDHOF members at the DEMA 2009 Awards Party. You can see CAPT(ret) Karin Lynn bottom row, first person on the left and CAPT(ret) Bobbie Scholley, back row, first person on the right. Legend of the Sea Zale Parry and Dr. Sylvia Earle are next to CAPT Lynn. Photo by Alese Pechter

Inc and Tammy Brown, a commercial Diver and currently the President/CEO of Divers Academy International. There are the women who are leading the way in education, science, research, conservation, medicine, arts, and safety. I can't list all 166 women here, but it is truly amazing for me to hear about what each of them have done already and continue to do. Being able to meet some of these icons of diving has really been a huge honor for me. You can see our members' roster with bio's on the WDHOF website.

But another reason I'd like you to know about WDHOF is so that you're aware of an organization that continues to honor new members. Anyone can nominate a woman for consideration as a new member, you don't have to be a WDHOF member to do so. The nominations are due by November 30th of each year and include a nomination form plus two letters of recommendation. The full nomination process is done electronically and can be found on the WDHOF website, along with a list of qualifications that the selection board is looking for in new members. Although we already have 18 US Navy Divers inducted into the WDHOF, I know there should be more. I just don't know who those others are. So if any of you know of a woman Navy Diver, either past or current, that may fit the qualifications to become a WDHOF member, please submit her for consideration. And if you're not sure, just contact one of the Navy Divers that are already members and ask for their help.

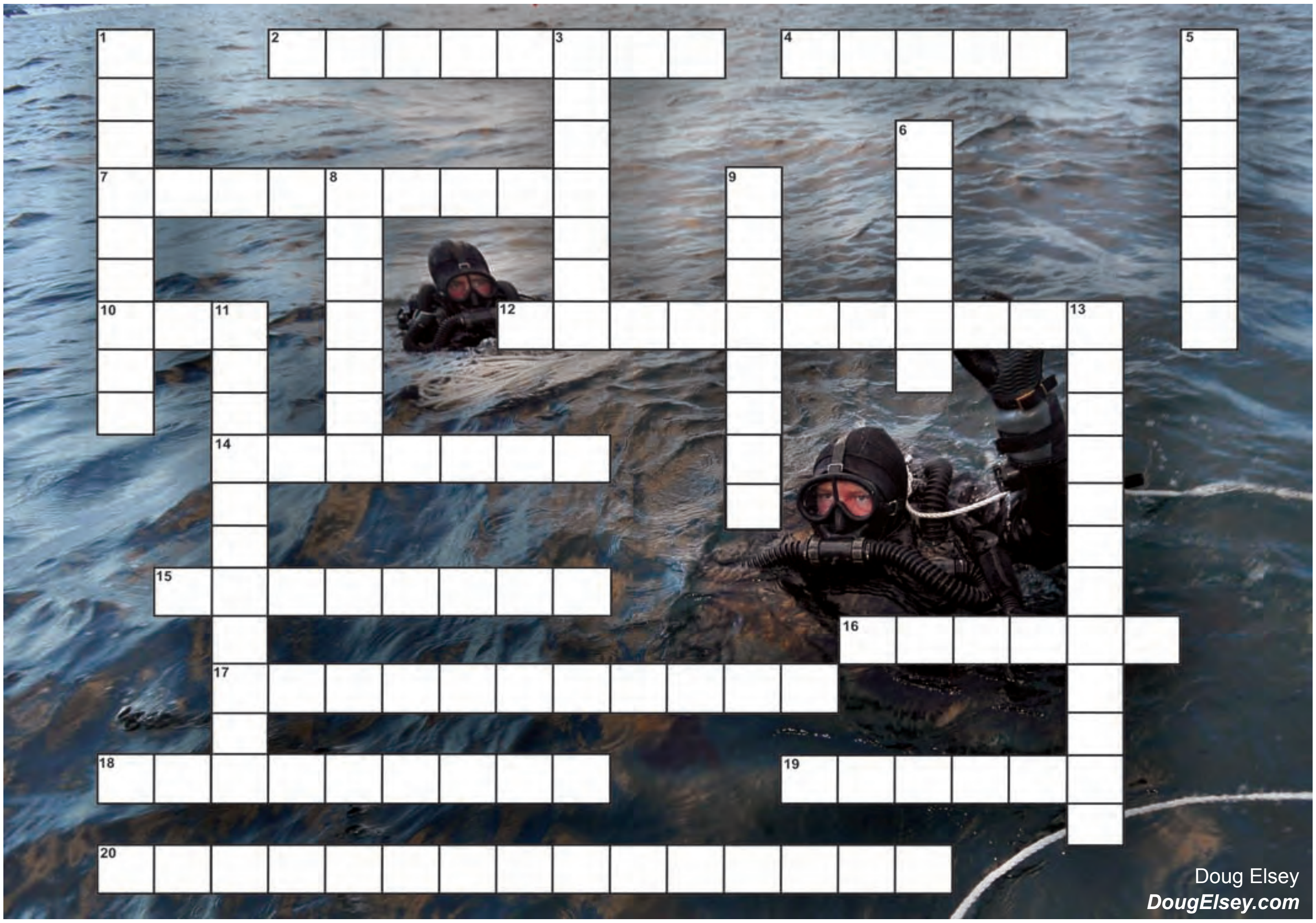
Of course I still think that US Navy Divers are the best Divers in the world! And part of my agenda as President of WDHOF is to convey that message to everyone I can. Most civilian Divers don't know much about us and my retirement mission is to educate them about all of you. Every chance I get, I tell stories about the amazing missions that US Navy Divers do and I get a very positive response from everyone I speak to. So, keep doing all the great work that you do everyday and most importantly stay safe. We all appreciate what you do to support our country and protect our freedoms. UPDATE: EAC (SCW/DV) Roseanne Oliveros, from UCT TWO, has just been selected as a new member by WDHOF. Her formal induction ceremony - will take place at BTS Expo, March 27, 2010. Congratulations Chief Oliveros!

WDHOF US Navy Members:

- **CAPT Debra Bodenstedt, Special Operations Officer**
- **EMCM(MDV) (Ret.) Mary Bonnin, Fleet Diver**
- **CAPT Bette Bolivar, Special Operations Officer**
- **CAPT(Ret.) Victoria Cassano, Medical Corps**
- **CAPT Gina Harden, Reserve Diving Officer**
- **CAPT Martha Herb, Reserve Special Operations Officer**
- **LCDR(Ret.) Linda Hubbell, SCUBA Diver**
- **CDR(Ret.) Darlene Iskra, Special Operations Officer**
- **CAPT(Ret.) Marie Knafelc, Medical Corps**
- **CDR(Ret.) Karen Kohanowich, Special Operations Officer**
- **CAPT(Ret.) Karin Lynn, Civil Engineer Corps**
- **CAPT Erica Sahler, Civil Engineer Corps**
- **CAPT(Ret.) Bobbie Scholley, Special Operations Officer**
- **CAPT Heidi Stefanyshyn-Piper, Engineering Duty Officer and Astronaut**
- **CAPT Kathryn Sullivan, Reserve Diving Officer and Astronaut**
- **Donna Tobias, Second Class Diver**
- **CDR(Ret.) Sue Trukken, Special Operations Officer**
- **CAPT Lori Yost, Reserve Diving Officer**

CAPT Bobbie Scholley is a former CO, USS BOLSTER (ARS 38), CO, MDSU TWO and SUPDIVE. She retired to Annapolis, MD after 24 years of Naval Service.

U.S. Navy Dive Manual: Chapter 7 - SCUBA Air Diving Operations



ACROSS

2. When a cylinder valve without an air reserve (K valve) is used, the SCUBA regulator must be _____ with a submersible pressure gauge.
4. _____ cubic feet is the minimum size SCUBA cylinder authorized.
7. Closed-circuit underwater breathing apparatus is the _____ method of performing SCUBA decompression dives.
10. Approved Scuba regulators are located on the _____.
12. Any buoyancy compensator selected for Navy use must have an over-pressure _____.
14. An _____ is an additional single hose second stage regulator connected to the Diver's first stage regulator.
15. The knife and _____ must not be secured to the weight belt.
16. Air reserve mechanism lever in the up position places the valve _____.
17. The rate charging SCUBA cylinders must be controlled to prevent _____.
18. _____ is the fastest and most efficient method for charging SCUBA tanks.
19. Tie wraps, tape, and _____ are not authorized to marry strain reliefs on charging whips.
20. SCUBA cylinders designed to Navy specifications must be _____ tested at least every five years.

DOWN

1. A movable _____ in the second stage regulator is linked by a lever to the low-pressure valve, which leads to the low-pressure chamber.
3. During _____ inspection, the Diver shall breathe the octopus to ensure it is working properly.
5. A rough-surfaced sheet of _____ makes an excellent writing slate for recording data.
6. If the Diver will be working under conditions where the suit may be easily torn or punctured, the Diver should be provided with additional protection such as coveralls or heavy _____ chafing gear.
8. Expired air is dumped from the low pressure chamber to the surrounding water through the _____ valve.
9. A _____ should be used when necessary to exchange signals, keep track of the Diver's location, or operate in limited visibility.
11. The life preserver must be of sufficient volume to raise an _____ Diver safely from maximum dive depth to the surface.
13. Submersible Cylinder Pressure Gauge should be tucked under a shoulder strap or otherwise secured to avoid its _____ with bottom debris or other equipment.

Photo Credits: Doug Elsey ***www.DougElsey.com***
Crossword answers on pg.29

COLD WATER REGULATORS 2009

By: Robyn McGinn

Icing of Mares Cold Water 1st Stage Regulator during on-site testing.

Cold water environments are exceptionally hazardous to Divers, requiring special equipment and operating procedures to ensure safety. One of the most important aspects to the success of cold water diving operations relates to the selection of proper, safe, and effective equipment. Therefore, it is important that performance data continues to be collected on regulators, buoyancy compensators, and dry suits in cold water applications. Since 2008, cold water regulators in particular have come under review by NEDU and SEA 00C and continue to be at the forefront of ensuring safety in waters below 37°C.

The Authorized for Navy Use program lists cold water regulators based on recommendations from Naval Experimental Diving Unit (NEDU) which are supported by the regulator's performance during unmanned testing. Usually, cold water regulators do not go through a manned testing evolution prior to approval because of the logistics that would be required to access the proper testing conditions. Fortunately, an NEDU representative was given the opportunity to partake in the Smithsonian Institution's dive expedition to Antarctica in October 2008. The details of this event are outlined in the July 2009 Faceplate article, "Cold Water Regulators – Smithsonian Institution's Dive in Antarctica." During the expedition, manned test data was gathered for several regulators that were commercially designated for cold water service. Some regulators performed well in the polar conditions while others experienced free flow issues due to the effects of pressure reductions and temperature drops in the breathing gas. With this information, the ANU program began a systematic review of all regulators that were designated for cold water service for the United States Navy.

With the information obtained from the Smithsonian expedition, SEA 00C limited the use of the Mares Proton Ice Extreme to water temperatures above 37°C (ref: Diving Advisory 09-07) because it suffered multiple free flows during the manned diving evolution. Following the removal of the Mares Proton Ice Extreme, SEA 00C tasked NEDU to perform unmanned testing on commercial cold water regulators purchased directly from local diving equipment providers to confirm the safety of the current configurations of the cold water regulators currently on the ANU list. The specific regulators that were tested are listed below:

- Sherwood Maximus, SRB7600CE
- Sherwood Blizzard, SRB7900
- Mares V32 Proton Metal
- Mares Proton Ice Extreme
- Poseidon Extreme
- Apeks TX50

NEDU concluded testing in the summer of 2009 and in response SEA 00C reaffirmed the restriction of the Mares Proton Ice Extreme to general service use in water temperatures above 37°C (ref: Diving Advisory 09-13). With the data collected by NEDU, the commercial regulators that can be utilized for cold water applications were narrowed down to the following:

- Poseidon Odin, P/N 3960-80 or 2960-80
- Poseidon Odin Octopus, P/N 29700000
- Poseidon Cyklon 5000, P/N 3950 or 2950-80
- Poseidon Cyklon Octopus, P/N 2981000
- Poseidon Thor, P/N 2940-80
- Poseidon Cyklon 300, P/N 2980-80
- Poseidon Xstream Dive, P/N 4791-GY
- Apeks TX 50, P/N AP0500
- Interspiro Divator MK-IIG and MK 20
- Kirby Morgan EXO BR MS, P/N 300-036MS

One factor influencing the expected performance of cold water regulators is the discrepancy between the commercial testing requirements and NEDU's testing requirements. Several manufacturers test regulators to the BS EN 250:2000 standard, which outlines the requirements, testing, and marking of respiratory equipment and open-circuit self-contained compressed air diving apparatus. For cold water regulator testing, the EN 250 standard requires fresh water testing for 5 minutes without free flow at 2-4°C, 50 bar tank pressure, an RMV of 62.5 L/min and a depth of 165 ffw. For cold water regulator testing, NEDU requires sea water testing for 30 minutes at -2°C, 1500 psi (~100 bar) tank pressure, an RMV of 62.5 L/min and a depth of 198 fsw. NEDU maintains a more rigorous test plan which is intended to capture the most extreme conditions that a military diver could be exposed to.

Due to the extensive use of the Mares Proton Ice Extreme in the Fleet and with free flow failure data that could not be ignored, SEA 00C put together a plan to visit the Mares manufacturing facility. The first objective of the visit was to perform an ISO 9001:2008 Quality Assurance audit, a requirement of the ANU program for CAT I & II equipment manufacturers. The second objective was to determine the cause of the free flow issues that occurred with the Mares Proton Ice Extreme.

In September 2009, representatives from NEDU, SEA 00C4 (Certification), and SEA 00C3 (Diving) visited the Mares regulator production facility in Rapallo, Italy. During SEA00C's site visit, it was concluded that the Mares' Quality Program fully supported their operations in conjunction with the ISO 9001:2008 standard. With respect to European diving standards and auditing agencies, Mares was also found to be in compliance with EN 250 and CE. Through the cooperative research between Mares and SEA00C, the root cause of the Proton Ice Extreme's 2nd stage free flow issue was determined to be from a design change made to the 2nd stage valve seat before the regulator went into full production. Mares exhibited strong determination to solve the problems the U.S. Navy was experiencing, performing several iterations of unmanned testing while SEA00C was visiting their facility. Their dedication during testing exhibited their commitment to ensuring the safety of U.S. Navy diving operations. The Mares Proton Ice Extreme continues to be authorized under the General Service section (1.3) of the ANU List. Currently, NAVSEA 00C, NEDU and Mares are working cooperatively to supply the U.S. Navy Fleet with the most suitable replacement options for the Mares Proton Ice Extreme.

Second Stage Regulator Design

References:

Dr. John Clarke, Faceplate article "Cold Water Regulators – Smithsonian Institution's Dive in Antarctica."

Ms. Robyn McGinn is currently serving as the ANU Coordinator at NAVSEA 00C, while providing engineering support to the Diving programs.

DIVE WAIVER PROCESS

By: MDV Henry Stark

Diving waivers are a request from the Commanding Officer to OPNAV N873 via NAVSEA 00C for technical review and are for situations that are outside of the normal guidance of the OPNAVINST 3150.27B and the U.S. Navy Dive Manual.

DO:

1. Read OPNAVINST 3150.27B.
2. Ask yourself is a waiver required?
3. Give compelling justification why the waiver is required.
4. Outline the Operational Risk Management and mitigation plan.
5. Include mission start and completion date.
6. Have Commanding Officer or Acting must sign the waiver.
7. Contact NDCM (MDV) Stark @ 202-781-3388 for guidance, prior to submitting the waiver request.
8. Scan to PDF and email to OPNAV N873 jamie.cook2@navy.mil and NAVSEA 00C henry.j.stark@navy.mil. No hard copy required.
9. Keep it unclassified if possible, if not, send via SIPRNET. Send a note via NIPRNET requesting we check SIPRNET for incoming waiver. Using Naval Message takes longer!
10. Submit waiver request as early as possible, when feasible!

DO NOT:

1. Wait until the last minute!
2. Have the waiver signed "By direction."

Remember, the more information provided and the earlier it is submitted, the better the chance the waiver will receive a favorable recommendation and approval. HOOYAH!

Command in the SPOTLIGHT

Naval Submarine Support Facility New London, CT

By: ND2 (DSW) Wade Luoma

Well we will start off this story just like all good stories should. Keep in mind this is a Deep Sea story that is completely true with most of the details embellished, as it should be.

So there we were finishing up a routine week of maintenance on the waterfront, if you can ever call what we do routine. A job came up for a preliminary inspection of the bow planes before cofferdams could be put on. So like any other day we pulled the boat forward of the unit not knowing what we were about to get ourselves into. USS VIRGINIA (SSN 774), First of a Class and Leading the Way, was the dive platform and the "sup de jour", ND1 (DSW/SW) Smith was ready to put divers in the water. Divers made their way to the project starting with starboard side bow plane. Finding no problems with starboard side the divers rogered up, "No problems starboard side, clear for sealing surface" topside came back over the coms," Roger that move on to port side", "Roger that Sup"… roger that.

Ah, port side. That whispering old lady she was. As divers made their way down to the project coms grew silent and topside began to resemble more of a library than a dive side. Coms crackled to life when red Diver rogered up. "Topside, red Diver… you're gonna wanna see this." Everyone on the side was silent as coms repeated back "Send it red." Red reported back with the following: "Portside bow plane has about thirty feet forward to aft going ten feet deep of missing MIP (Mold In Place) directly through the sealing surface. Depth of MIP is about four inches."

Topside reported back and had a camera sent down to take a closer look at the project, but the visibility was so bad and the area was so big they couldn't get a feel for where and how big the area was. So we had to do it the old fashioned way, grease pen and clip board style. When the Diver reached surface and handed the clipboard up to the sup you could almost hear the sup's thoughts as his eyes got wide and mouth dropped open. All at once we all knew we were in for a task never undertaken by NSSF dive locker, maybe even any dive locker. Our task was to create an artificial sealing surface for the approximately 10x10ft, 30,000lb. cofferdam to rest on with minimal leaks and reliable enough to put our word against everyone else's that we could make it happen, and with MDV Winter running the show nothing was going to stop us. But first we had to make a plan… and a plan is exactly what we made, whether or not it was going to work was the question.

By now word of our plan had spread around the command and to the unit itself. Everyone thought it was impossible. We were told it wasn't going to happen, even around the locker there were bets being placed for the cofferdams imminent failure. "If I was the one crawling down that box, big navy better be ready to pay up" was one common phrase or at least something close to that. Walking past smoke decks you could hear sailors and civilians alike betting odds against whether or not we could make it work, with the overall view being that we were going to fail miserably. So here was our plan, we were going to use some MIP plates ESSM had laying around to create a smooth surface for the cofferdam to seal on. The problem was holding all the plates in long enough for the glue we were using to set. So our final solution was to use five fifty cord and wood screws to distribute pressure to the areas we needed it in and after the gluing had been completed use ratchet straps to give good even pressure throughout the whole thing. By the time we were done we had the front of this fast attack nuclear submarine looking like a spider web wrapped up in a shoelace factory that just got hit by the biggest wrinkle bomb of the century. For the forty eight hours all this rigging gear was on the boat to allow the pf944 to cure the USS VIRGINIA was officially the USS IF THIS WORKS SOMEONE IS GETTING A RAISE. If you looked at it from topside you would have thought MDV had lost it. Sure enough though once those forty eight hours were up the rigging gear was removed and we had our sealing surface. Now it was time to do what we normally do, rig up the cofferdams, get a seal, pump em' down, and still make it out the door for beer thirty. We still had a lot of work ahead before we could call this one just another Deep Sea day.

Finally the fateful day came. Around 1800 we began rigging up starboard side cofferdam. Once we got both cofferdams hanging on the two pairs of two 10-ton chain falls we began to pump both sides down simultaneously. Starboard side was pumped first and had zero leaks. Port side followed with significant leaks. Divers worked tirelessly till 2300 with Bintsuke to patch the leaks coming from the top and sides where there were creases in the MIP plates. Once we reached a reasonable rate topside support were able to install flood alarms and set pumps to auto. Around 2345 MDV called it job complete and we broke down station. We had concluded the job no one thought we could do, not even ourselves. To put it in perspective, when the port side cofferdam was initially pumped down the pump was still kicking on every ten seconds to disperse the water, once we had completed our patching and plugging the pump would kick on once every twenty two minutes to pump out residual water for a maximum of five seconds. That is the way it remained throughout the maintenance conducted by the ship and outside contractors. A few weeks later after a total accumulated bottom time of over eighty hours, with little celebration we removed the cofferdams in less than an hour and hoisted them on to the YD for cleaning, breakdown, and shipping back to ESSM.

Everyone always says "Oh you work at NSSF, you know what SSN stands for don't ya?" and trying to be courteous we respond, "Saturdays, Sundays, Nights". Well there's more…. Like every Thanksgiving, Christmas, and New Year… we just don't have any witty letters to explain those. MDV always says this is the best time of your life and the most responsibility you will have as a Second Class Diver in your career. We work constantly in a hostile environment, in tight spaces, and within close tolerances. When other divers hear our stories of breaking ice to get in, even they wince and wonder how we do it. Well the answer is easy; we are NSSF Dive Locker… Pride of the East Coast… Gem of the Sub Force… and we are the leading dive locker for development and implementation for new maintenance procedures for our submarines as well as the hardest working dive locker in the US Navy.

Crew:

- ND1 (DSW/SW) Jason Smith (Supervisor)
- ND1 (DSW/ SW) Alexander Larsen
- ND1 (AW/NAC/FPJ) Nelson Trevallion
- ND2 (DSW) Michael Baum
- ND2 (DSW) James Duffey
- HM2 (FMF/DMT) Kevin Knott
- ND2 (DSW) Wade Luoma
- ND2 (DSW) Matthew McGrath
- ND2 (DSW) Jonathan Scalise
- ND2 (DSW) Joseph Simpson
- ND2 Christopher Stimmel
- ND2 Christopher Green
- ND2 Calum Sanders
- ND2 Sean Lewis
- ND2 Andrew Pinegar

Photo above & Cover: Installation of RBP Cofferdams on USS VIRGINIA.

RBP Cofferdam Assembly.

ND2 (DSW) Luoma graduated dive school with class 08-10-2C, and was assigned to NSSF in February 2008.

They Say it Couldn't be Done

By: ND2 Andrew Murphy

They said it couldn't be done… but tell that to the guys who did it.

When NSSF sent us down the road to Electric Boat to learn how to change out the motors on the OA-9070 system, we just thought it would be one of those things that we learned, but were never given the chance to apply. Going there for the better part of the week gave us a feel for some challenges we might face when doing this job waterborne, but only some. It's completely different lowering a 1,100 lb. motor out of a grate, in a dry environment and onto a pallet four feet below, than having to lower it out of a grate, bring it thirty feet through the water column, up and over, and still have all the electrical fittings remain dry. There was word going around that it couldn't be done waterborne... but we showed them otherwise.

When told we would actually be doing the job in August, the three of us who had the chance to see it in dry dock were ecstatic. This job had never been done before on the VIRGINIA class submarine and these kinds of jobs mean only one thing …more bottom time.

The NSSF dive locker ended up working hand in hand with Naval Undersea Warfare Center, the technical experts on the system. They had a good idea of what to do, and we were there to do it. The first thing we had to do was to get the ballast tank prepared for the lifts. But before rigging could even be started we spent several days worth of bottom time troubleshooting and fixing a fouled towed array inside of MBT 5B. After the unforeseen prerequisites were met, with the assistance of a NUWC engineering Diver and NUWC topside support, NSSF Divers managed to change two towed array motors, a salinity sensor, pinch rollers, a refurbished upper containment, and various parts of the OA-9070 towed array system. To sum things up, everything but the stowage drum, but I'm getting ahead of myself…back to the rigging. This meant bringing the chain falls down, the boot straps and lever hoists, and removing the ICCP. around the grate. One new thing our NUWC guys brought were some high speed ballast tank lights, which we mounted in each corner of the ballast tank. It may not seem like much, but these lights proved instrumental in the completion of the job. It was always interesting at the start of a day, diving down to the project and seeing light pouring through the grates.

Right: The motor in drydock at Electric Boat, going through the grate.
Left:The motor seen here with the bedplate obstruction.

When we finally lifted the first motor which was back by the capstan, we installed rounded, stainless steel metal plates with holes in the ends, on each foot which extended out about two inches on either side, to protect the feet and also something we could use to guide the motor out of the grate. The actual movement of the motor was the easy part, shifting the weight between chainfalls to move it, and rigging in the different points to rotate the motor. It really only gave us trouble when moving behind the stowage drum, and bringing it down the corner of the ballast tank. There were support beams every two feet that the motor would get hung up on, which to correct, we would have to take up on the chain falls, and adjust the motor to get it back in position. So we finally got it to the grate. Here is where the real problems came. We have a 1,100 lb. motor, about three feet wide, and a grate opening that's about three feet two inches wide. If that were the only problem we would be good to go, but we also have a quarter inch thick bed plate we need to get the feet of the motor under, angle irons to rotate around, and four oil compensators we have to worry about shearing off. Did I mention the fact that in this same hole we are pushing this motor through, we also have two umbilicals and two EGSs, which needless to say we can't pinch. Oh- and if you come in at the wrong angle you can get it stuck, but will not know it's at the wrong angle until it gets stuck…but I'll get into that later.

So there we were with the motor at the grate. To get it through we have to approach the grate with the motor horizontal, and once under the bedplate we have to rotate the motor at a downward angle and inch it on out until we can get it vertically hanging outside the grate. For the first motor, we did just that. It took us only four hours to do it. I know it doesn't seem like it should take that long but with only one inch of play on both sides and a new obstacle every inch to overcome, tedious doesn't even begin to describe it.

Once the motor was out of the tank, it went pretty smoothly. We hooked the motor into the crane and had to pay out on the chainfall while the crane took up the slack. Needless to say the first motor was not pretty. It had scratches, dents and a serious amount of missing paint, but it was out. The next obstacle came with removing the second motor. This motor is hanging upside down, twenty feet up in the tank and you only have one way of getting above it, which is a ladder alongside it which gives you limited access above the motor to rig it. But that was not the problem. We got it down and by the grate in less than an hour. The problem was getting it out of the grate. If you remember that wrong angle I was talking about earlier, we got it in the wrong angle, and we got it stuck, and four hours later were out of bottom time, with 1,100 lbs. of metal and wires between us and the exit. What had happened was that the motor had gotten halfway out of the grate, two oil compensators out of the grate, and two oil compensators in the grate, and the motor had shifted that inch we didn't have. So now the oil compensators are keeping the motor from going out of the tank, and keeping it from coming back in the tank. Oh and to make matters worse, remember those EGS's in the opening with the motor…well there was one less now. It makes for a very interesting time as you're adjusting a motor, trying to get out of a tank knowing you're already on decompression time, and you suddenly hear a pop and see all the water around you bubble as a heavy mist fills the tank around you. A third Diver was splashed to give us eyes on the outside of the tank, and another EGS, and in a matter of 30 minutes got the motor back in, more or less in an acceptable condition and proceeded follow our table and schedule to finish out our decompression dive.

With all that done and a new understanding and respect for the motors we were moving, we finished removing the second motor. Now we had to get two back into the tank, except this time we couldn't scratch or ding them. In fact if we damaged the feet at all, it could throw off the alignment with the shafts, causing more rework and potentially making the motor unusable. We also couldn't damage the shaft at all, because that too could throw off the alignment as well. With all this in mind, we had to take a look at what we could improve. The answer came down to one thing. It was the three point bridle we had on the motor, which was used as the main rigging point. The problem we had was that it was too long. With a shorter bridle, we would have more control over the motor's movement, and more room to maneuver it. Once we had the new bridle on, getting it in the tank was a three hour process, with one diver on the outside as eyes, while two were inside manning the chain falls and lever hoists. Both motors were finally installed with both in excellent condition. The shafts lined up and all measurements were good. The Flex couplings were back on, all bolts were torqued down and all electrical connections were installed and all tested satisfactory…eventually. The job had been completed.

It's easy to say this can be done or this can't be done as an outsider looking in. But we are Navy Divers. If you tell us we can't do something, we are going to do it just to prove you wrong. I do have to say that my favorite part about this job is, since it had never been done before, our NUWC support knew as much and as little about procedures as we did, therefore they were constantly bouncing ideas off of us, looking for our input and using it. We contributed as much to the success of this job as the guys who have engineering master's degrees, and often times, finding ways around problems that they couldn't. How many other professions out there let you go thirty feet underwater and swing a 1,100 lb. motor around a ballast tank? I can only think of one. Hooyah Deep Sea. Lead Divers BT:

- ND2 Murphy: 49 hrs
- ND2 (DSW) Bates: 32 hrs
- ND2 (DSW) Nonnenmann: 33 hrs
- ND2 (DSW) Elbert: 12 hours
- ND1 (DSW) Persinger (Supervisor)

ND2 Andrew C. Murphy graduated Dive School in October 2007, and has been Stationed in Groton for two years.

New London

ND2 (DSW) Matthew J. McGrath

New London, Connecticut is home to the Naval Submarine Support Facility Dive Locker. These Navy Divers may only reach a maximum depth of 35 feet but assure you they are the best at what they do; repairing nuclear powered submarines. No matter the season or weather condition this dive locker can be seen maxing out set after set of divers and burning the midnight oil.

Recently the Dive Locker performed the first waterborne replacement of a Secondary Propulsion Unit (SPU). With the advent of the Virginia Class Submarine it was only a matter of time that this would arise. We did it, not once but twice. The first time it was done in less than 10 days and the second time in less than 6 days. Since this was the first operation of this and the procedures and equipment had not been validated we had all the engineering and technical support that any dive side could ever want.

The dive started on a Monday June 22, Dive side was as follows: Dive Supervisor: ND1 Jacob Schonacher; Red Diver: ND2 Matt McGrath; Green Diver: ND1 Jason Counts; Yellow Diver: ND2 Sean Lewis; Tenders: ND2 James Duffey, ND2 Andrew Pinegar, ND2 John Roth; CL/Air: ND2 Truett Griffin.

Due to the preliminary nature of this job, there was a mystery leak just after the cofferdam seal, making it impossible to move on with the job without a good seal. After 2 days of searching, ND2 Duffey found 2 pipes that required DC plugs, the bottom sounder vent hole and the cover plate bolts. On day four, the cofferdam was installed and bubble was solid, so we began dismantling the cow tongue, installed the motor rigging fixture, 4 chain falls with a level 4 point pick. This was an aluminum cradle with lifting eyes which aided in lowering, rotating, and yard and staying the motor from inside the cofferdam onto the pier. Once on the pier the motor was meggered and found to be SAT. After replacing the A phase cable the motor was mounted back on its column. Once the inside of the tank was reassembled and the grounding strap was replaced and the submarine was ready for sea trials.

One week later the phone rang with the message "The SPU on the VIRGINIA has grounded out." During sea trials two of the cables were damaged causing a ground indication. In order to ensure that the ship could make its maiden deployment, it was decided to replace the motor and all three power cables. Once again the Alpha Dive Team assembled and this time within one day had the cofferdam installed, all leaks secured as well as the rigging hanging for the motor. On day two the Alpha, Bravo, and Charlie Phase Cables were removed and on the pier along with SPU the Dive team was turning and burning. The SPU was waterborne again and hanging from the 4 chain falls within the cofferdam on day three. The three 100-pound cables each hanging from the electronic hull fitting, and ready to be attached to bring life to the new unit. On day four the SPU team had the motor hydrostatically tested and applied the final torque on the column bolts. By day five the dive team was de-rigging the cofferdam and sending all the materials topside. Finally the cofferdam hit the pier and the motor had tested satisfactorily on all accounts. Some may have thought that this could not be done once, much less twice, but for the NSSF Dive Locker it was just another day at work under difficult conditions.


SPU cofferdam entering the water for installation


SPU entering the water for re-installation

Article Cover Picture: SPU Cofferdam entering the water for installation.

ND2 (DSW) Matthew J. McGrath enlisted in the U.S. Navy in April 2007. Upon completion of initial training, Petty Officer McGrath was assigned to Naval Submarine Support Facility New London in December of 2007.

Pollution Response: A Key Salvage Enabler - Continued from pg.7

Another historical case of environmental salvage was the USS MISSISSINEWA (AO 59) a U.S. Navy oil tanker that was a silent war grave for over 50 years until it began leaking oil into the Ulithi lagoon in August 2001. Though the Navy was able to plug the oil leaks from exposed piping, the possibility of a greater release seemed imminent. This prompted a formal request from the Yap State Government for the U.S. Navy to offload the oil. Offloading operations were successfully completed in February 2003, with an estimated 1.95 million gallons of oil being pumped from 21 tanks, the engine room, pump room and pipes.

Environmental protection is such a sensitive issue that well-intentioned authorities may lose sight of the hazards to the vessel in their efforts to prevent pollution. It is the charge of salvors to be professionals in dealing with emergency situations. They have the responsibility to ensure a balance between salvage action and environmental protection.

Stephanie Brown is the Oil Spill Response Program Engineer in the Salvage Operations Division of the Navy Supervisor of Salvage and Diving Office (SUPSALV) where she serves primarily as the life cycle manager of SUPSALV's pollution equipment inventory.

...A Few Notes from
The Husbandry Side of the House

By: CWO Timothy Axline

Reviewing past issues of Faceplate magazines, I have noticed we are due for an update from 00C5 Underwater Ship Husbandry Division. Several new personnel have joined the NAVSEA team over the past few years alongside our seasoned veterans. Bill Reid (00C5) is the Director here at the Washington Navy Yard (WNYD) with the following personnel making up the supporting cast. They are listed by Code, specialty and location:

CWO3 Timothy Axline (00C501) UWSH Projects & Operations, WNYD
Scott Heineman (00C502) Marine Operations Specialist, San Diego, CA
Russell Mallet (00C503) Marine Operations Specialist, Norfolk, VA
Rich Schoenweisner (00C51) Submarine Unique Systems, WNYD
Jeff Zook (00C53) Underwater Welding Engineer, WNYD
Geoff Healy (00C54) Cofferdams, Shafts & New Ship Class Designs, WNYD
Tom McCue (00C55) Hull Cleaning, Paints, Cathodic Protection, WNYD
LCDR Joshua Lapenna (00C56) UWSH Projects & Operations, WNYD
LT John Bauer (00C58) UWSH Projects & Operations, Currently on IA
Justin Pollack (00C59) Propellers, APU and Bearings, WNYD
Marty Sheehan WSQ-9 Manager, Panama City, FL

35 million dollars. How many dive boats could you buy with that? As most of you probably answered, "Enough". This is the dollar amount in dry-dock cost avoidance savings; conservative and loosely figured, based solely on FY09 major underwater repair efforts. Cost avoidance figures are not easily computed. Dozens of variables affect costs of each docking, which is why I use the term "loosely figured". A dry-docking cost analysis is also in progress that will be available for future use. Fleet Divers have logged hundreds of hours of bottom time and repaired scores of vessels, all on a reduced budget, with aging support craft. In an effort to help alleviate demanding maintenance requirements for these support craft we are investigating procurement of new dive boats. We currently have other initiatives that will provide one or two boats but many vessels have surpassed their service life and need to be replaced. Your needs are not being ignored, we just request patience and continued support.

Among many other irons in the fire: ERR, BDR, and ANU have all been getting due attention. You know what ANU stands for, but what are BDR and ERR? Battle Damage Repair (BDR) and Equipment Requirements Review (ERR) are familiar to some of you. BDR is a task in which Southwest Regional Maintenance Center (SWRMC) has become heavily involved along with Puget Sound Naval Shipyard (PSNS) and Pearl Harbor Naval Shipyard (PHNSY). The goal is to provide equipment and train personnel to support emergent repairs to battle damaged vessels wherever local assets are unavailable. Further details are contained in Pacific Fleet Operational Orders. ERR is a term borrowed from the Salvage Division. We conduct these reviews to ensure sufficient equipment is available to support repairs without having to ship gear from one side of the country to the other. End user feedback is also collected to ensure equipment functions as designed. Finally, we recently approved the use of the Hilti UW-10 Underwater Tool. It is listed in ANU under section 9.3 Tools. In service since 1990, this tool will assist divers in repair efforts on vessels damaged in battle or any situation where emergent underwater repairs are required. We are also working on approving a new GFI and water blaster.

I have one final note related to equipment. LCDR Lapenna and I are your go-to guys when it comes to securing UWSH equipment from ESSM. Soliciting ESSM may get you some valuable information but nothing moves unless it comes through 00C5. We have a busy year ahead starting with the DDG 51 Class CPP Bolt Torque Inspection requirements. This story can be found on page 04 of this issue. See you in the Fleet.

CWO Timothy Axline is currently serving as UWSH Project/Operations Manager at NAVSEA 00C.

Crossword Puzzle Answers

Across:
2. Equipped
4. Fifty
7. Preferred
10. ANU
12. Relief Valve
14. Octopus
15. Scabbard
16. Closed
17. Overheating
18. Cascading
19. Marlin
20. Hydrostatically

Down:
1. Diaphragm
3. Predive
5. Acrylic
6. Canvas
8. Exhaust
9. Lifeline
11. Unconscious
13. Entanglement

USS NEW ORLEANS (LPD 18) Collision Repair

By: LCDR Jay A. Young, USN, PE

On 20 March 2009, USS NEW ORLEANS (LPD 18) collided with USS HARTFORD (SSN 768) while transiting through the Strait of Hormuz. Immediately following the collision, ship's force reported flooding in Fuel Oil Storage Tank (8-63-1-F), Compensating Ballast Water Tank (8-73-1-W), and Main Ballast Water Tank (8-95-0-W). Ship's force also reported fuel oil leaking from the starboard side in the area of frame 70.

In the moments following the collision, NEW ORLEANS lost an estimated 30,000 gallons of fuel oil into the sea through a rupture in 8-63-1-F and approximately 20,000 gallons of fuel oil remained in the top of the tank due to hydrostatic pressure. Without knowing the full extent of the damage to the underwater hull or the structural integrity of the damaged tanks, New Orleans immediately proceeded to Naval Support Activity (NSA) Bahrain for inspection and repair.


Figure 1

Mid-Atlantic Regional Maintenance Center Detachment Bahrain (MARMC DET Bahrain) coordinated and executed all inspections and assessments upon the ship's arrival with support from Mobile Diving and Salvage Unit Two (MDSU TWO) and the Supervisor of Salvage and Diving (SUPSALV). NEW ORLEANS arrived at Mina Salman Pier in Bahrain on 21 March 2009 anticipating an extensive repair period.

Navy Divers from MDSU TWO were standing by to complete the damage assessment when NEW ORLEANS arrived in Bahrain. MDSU TWO Divers commenced diving operations on 22 March 2009 and focused the initial damage assessment around the known damaged locations. The external inspection revealed extensive damage to the shell plate and bilge keel in the vicinity of frame 70. A thirty foot section of the starboard bilge keel was crushed, broken, and pushed inside of the fuel oil tank. The submarine had punched a fifteen foot long by sixteen foot high gash in the fuel oil tank and ruptured the bulkhead separating the fuel oil tank from the compensating ballast water tank.

Following the initial inspection of the external damage in the vicinity of frame 70, the divers moved aft to assess the damage to Main Ballast Water Tank 8-95-0-W. The Divers reported a fifteen foot scrape running forward and aft approximately twenty feet off centerline to starboard. Two small punctures were identified in the shell plate of the Main Ballast Water Tank and in line with the existing scrape. One of the punctures was eight inches long by three inches wide, and the other puncture was nine inches long by three inches wide. No further damage was identified in the vicinity of either location.

The Divers spent several dives detailing the external damage to the fuel tank and the two ballast tanks and measuring the extent of the damage in relation to various reference points on the underwater hull. Once all of the external damage was properly documented, the divers entered the damaged fuel oil tank to complete an internal structural inspection.

The fuel oil tank was twenty three feet long, three decks high and extended twelve feet inboard from the external hull. Divers crawled over and around the mangled shell plate and stiffeners to get into the tank. Once inside of the tank, Divers maneuvered to all corners of the tank to inspect and document the structural damage to the internal frames, bulkheads, transverse stiffeners, longitudinal stiffeners, and piping systems. Divers spent several hours inspecting structural damage, measuring the extent of all structural damage, and documenting all of the damage using an underwater video system. The ship repair community used the detailed structural assessment and underwater video to determine the proper repair procedure.

Navy Divers completed the detailed damage assessment which included damage to the ship's external hull and internal structure. Aware of the extent of the damage, U.S. Navy leadership pondered whether to complete a temporary waterborne repair or to complete a permanent dry dock repair. The ship repair community weighed the advantages and disadvantages of the waterborne and dry dock repair options and concluded that a hybrid repair using both waterborne and dry dock repair phases was the best course of action to save time and cost.


Figure 2

Figure 4

SUPSALV contracted Divers from Phoenix International to remove the damaged material from NEW ORLEANS. Once the fuel was pumped from the fuel tank, Phoenix Divers continued the waterborne repair phase by removing the majority of the damaged shell plate, longitudinal stiffeners, and transverse frames. They worked around the clock for six days and removed all of the damaged material from the area around the fuel oil tank (8-63-1-F) and the compensating ballast water tank (8-73-1-W) using an underwater arc gouging system (Figure 1).

Once all of the mangled steel was cut away from the hull, Divers cropped out the surrounding steel to minimize the stress concentration areas in the hull. Divers removed 275 square feet of shell plate, 72.5 square feet of bulkhead plate, 134 feet of longitudinal stiffeners, and 32 square feet of framing from the compensating ballast water tank and the fuel oil tank during the waterborne repair phase (Figure 2 and Figure 3).

Removing the damaged material waterborne served two purposes. First, waterborne removal of the damaged material reduced the amount of rip-out required once the ship was dry docked and effectively reduced the total time spent in dry dock. Waterborne damage removal also allowed Navy engineers to

The first step in the waterborne repair phase was to defuel the fuel oil tank. Before damaged material could be cut away from the hull, the residual diesel fuel contained in the fuel oil tank had to be removed. Since the fuel tank top was located below the waterline, a large amount of fuel was trapped at the top of the tank. The ship estimated that 20,000 gallons of diesel fuel remained in the fuel oil tank. Ship's force could not defuel the tank using the installed suction system because the suction was located at the bottom of the tank below the fuel-to-water interface and could not defuel the tank through the tank top because the tank was pressed up as a result of hydrostatic pressure. The fuel needed to be pumped out through the hole in the side of the hull.

SUPSALV pre-positions Emergency Ship Salvage Material (ESSM) and equipment in the Fifth Fleet Area of Responsibility to support and augment Fifth Fleet capability in the areas of salvage, diving, pollution response, and underwater ship husbandry (UWSH). To safely remove the diesel fuel from the damaged fuel oil tank, MDSU 2 Divers assembled and installed two 2-Inch Hydraulic Submersible Pumps from the ESSM Pollution Equipment inventory under the water outside of the damaged fuel oil tank. Divers routed the pump discharge hoses to an empty fuel barge moored outboard of NEW ORLEANS. The Divers attached suction hoses to the hydraulic submersible pumps and routed the suctions through damaged hull to above the fuel-to-water interface. The fuel was pumped from the fuel oil tank through the hole in the ship's hull to the fuel barge on the surface. The Divers continued to feed the suction hoses farther into the tank to stay above the fuel-to-water interface until all of the diesel fuel was removed from the tank. Approximately 20,000 gallons of diesel fuel were pumped from the tank in three and a half hours.

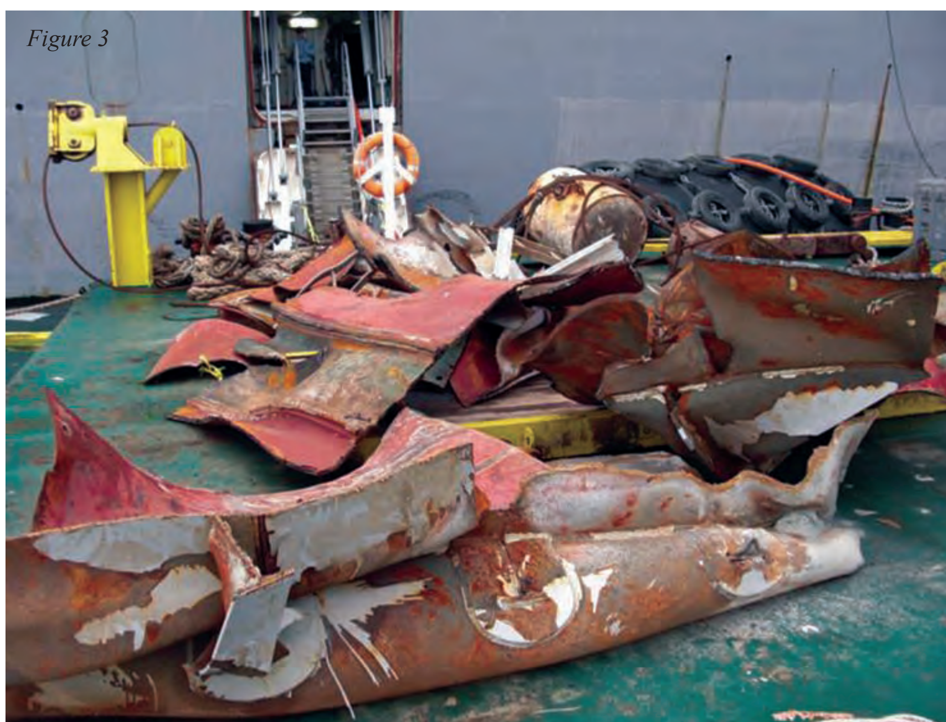


Figure 3

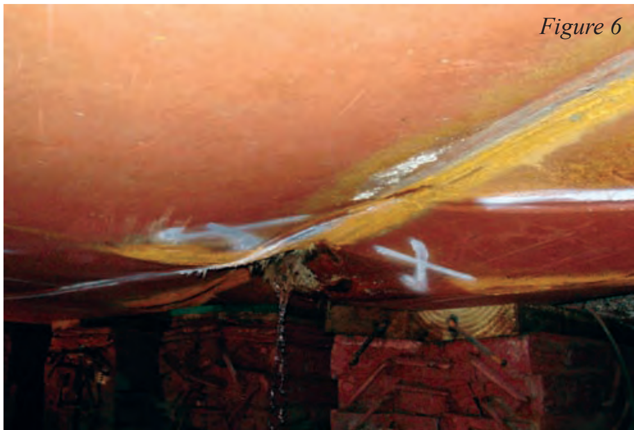


Figure 6


Figure 7

accurately identify the material requirements in advance. Engineers correlated the removed material to the ship's construction drawings to generate the material list used by the shipyard to prefabricate replacement shell plate, framing, and stiffeners. The emergent nature of the repairs resulted in limited time to procure the required materials which made an accurate damage assessment and material list essential for a timely dry dock repair.

Following the waterborne repair phase, NEW ORLEANS was dry docked in Bahrain in the Arab Shipbuilding and Repair Yard (ASRY) graving dock on 25 April 2009 along with MV VIRGINIAN and the ENSCO 97 Oil Platform (Figure 4).

The damage assessment in the dry dock revealed even more damage to the underwater hull than previously identified during the waterborne assessment. The damage in tanks 8-63-1-F and 8-73-1-W matched the initial damage report (article cover photo), but the damage in tank 8-95-0-W was more extensive than reported during the underwater inspection. The shell plate surrounding the documented punctures and scrape was dished approximately four inches and extended out approximately ten feet in all directions and damaged the ship's keel plate (Figure 6).

The shipyard removed all of the damaged shell plate and stiffeners while simultaneously installing stiffeners and shell plate in all four damaged areas in only fourteen days, but the critical path to completion was the repair of Fuel Oil Tank (8-63-1-F) and Compensating Ballast Water Tank (8-73-1-W(Figure 7).

The rip-out and structural assessment completed during the waterborne repair phase greatly reduced the time to complete dry dock repairs. ASRY permanently replaced 111 feet of framing, 227 feet of longitudinal stiffeners, and 911 square feet of shell plate ranging from 10 mm to 42 mm in thickness. The shipyard also replaced a 30 foot section of the starboard bilge keel which included 200 square feet of steel plate.

The Arab Shipbuilding and Repair Yard completed all repairs on 11 May 2009 (Figure 8), and NEW ORLEANS was undocked on schedule on 12 May 2009.


Figure 8

The U.S. Navy production team worked hand-in-hand with their contractor counterparts to overcome barriers, complete the emergent repairs, and keep the production effort on schedule. Once undocked, NEW ORLEANS continued assigned missions on deployment in the U.S. Fifth Fleet Area of Operations.

The onsite production team consisted of members from MARMC Detachment Bahrain, MARMC Norfolk, Norfolk Naval Shipyard, Arab Shipbuilding and Repair Yard, Mobile Diving and Salvage Unit Two, Supervisor of Salvage and Diving, and Phoenix International, but numerous commands from around the world provided outstanding support to ensure the success of the repair operation. The total repair operation spanned fifty four days, and numerous individuals worked day and night to execute a quality repair on schedule. The repair operation tested the capability and responsiveness of the Navy's ship maintenance community and leveraged the talents of both divers and dry docks to create an effective repair team. Mission Accomplished!

LCDR Jay A. Young is the Engineering Duty Officer and Salvage Officer who led the NEW ORLEANS repair operation while assigned to CTF 53 / MARMC DET Bahrain. LCDR Young is a 1998 graduate of the U. S. Naval Academy and specializes in Ocean and Mechanical Engineering.

The Old Master

Over the last 31 years I have seen many changes, hell Divers becoming a rating was talked about 31 years ago when I went to SCUBA school in Pearl Harbor, Hawaii. There are many things I would like to address here Leadership, Accountability, Professionalism, to name a few, but I wanted to take the first couple paragraphs and tell you the world according to Master Diver Winter.

It has been my distinct honor to serve with the very best men and women the Navy has to offer, Navy Divers. If you think you're not the very best look at any major diving Command, do you see any Trident or Crab wearers walking around? Now look at any EOD or SEAL Command, they all (or a majority of them) have NDs. Why is that? Does a MDSU require an EOD tech or SEAL to accomplish its mission? Does any underwater ships husbandry Command require an EOD tech or SEAL to accomplish its mission? Here is the reality, Navy Divers are the world's underwater experts. We are the standard by which all other underwater qualifications are measured.

Master Diver Winter is currently serving at Naval Submarine Support Facility New London, CT.

Navy Divers have always been engaged in the conduct of their primary duty, we have not been exercising or practicing, we have been diving. We have honed our skills on countless missions. We have kept our surface and submarine forces battle ready. We have braved the cold, dark depths and picked up the twisted, broken pieces of ships, submarines, and aircraft, commercial, private, and government owned. We have operated internationally. We have operated inter-service and we have operated for both local and state agencies. Wherever there has been a major catastrophe involving water, Navy Divers have been there.

Deck Plate Leadership, leading from the front. In my career I have never asked or ordered one of my Sailors to do something I have not, would not, or could not do. There are those that call themselves Deckplate Leaders but could not find the deckplates at high noon on a sunny day with a GPS and an armed escort. I believe that leadership is not something that can be taught in some class or through an online course. It is something that is shouldered by an individual through time, experience, and sometimes through circumstance.

Consistency and Purpose. Consistency in holding yourself to a higher standard, instilling those standards into those in your charge and holding yourself and your sailors accountable. Purpose in understanding your Command's mission and communicating how best you can support that mission to your troops. Purpose in taking an active role in molding your troops through training, OJT, and real world experience to fully prepare them to take your place. This will allow them the best chance for success, in many cases the best thing you can do for an individual sailor is in direct conflict with what that sailors desires. That is where you as the Master Chief, Master Diver, or senior leadership must take a stand and hold your ground. That Sailor will not understand it then ... But I guarantee that sailor will call a few years later and say thanks for making me do that ... I get it now.

Standup for what you believe in, do not accept blindly or willingly all that you are told or ordered to do. Nothing is impossible for the man that doesn't have to do it. Be prepared to go to General Quarters with those over you to protect your Sailors, even to the point of risking your career, if you truly believe in what you're fighting for. Pick your battles. Just because you may not feel it's right, doesn't mean that it doesn't have to be done and will most likely be done by someone else, eroding the confidence of your superiors in your ability to lead.

Plan for the worst and hope for the best, (or the 7 P's - Prior Proper Planning Prevents Piss Poor Performance) always be one step ahead, know your contingencies and be prepared to make course corrections immediately. Having an alternate plan of action allows you the flexibility to continue to move forward with minimal confusion and stress to your troops. This instills confidence in your Sailors in your abilities to lead them safely through the most arduous and dangerous missions. Your Sailors may follow you to the gates of hell, but without a clear and well communicated plan you may just lead them there.

Patience. Remember YOU were once that young sailor. Where would you be today if that Master Chief or Master Diver hadn't taken the time to see and understand the things you did well and the things you had to do over and over? What I'm trying to say is, don't forget where you came from. Find your Sailors' strengths and emphasize them. Harness and utilize them to build the Sailors' confidence in themselves while continuing to work on their weaknesses.

Character, Integrity, and Trust are the cornerstones of good Leadership. To the best of my limited abilities I have described these. There is also that which is intangible, indescribable, We in the Diving Navy know it as HOOYAH!! The overwhelming desire to be and do your very best, to rise above surroundings and circumstance to push past limits and expectations and hopefully to raise your troops with you, making them see that they are capable of more than they ever thought possible.

This is what I believe. By the time you read this I will have retired. Thanks to all those who have provided me guidance, support, and advice over my career. I will never be able to repay you. If you find yourself in Tennessee in the future look me up. There will be a warm meal and a cold beer waiting for you, on this you have my word.

HOOYAH DEEPSEA!!

SUPDIVE SENDS ...CDR Mike Egan

I wrote this article in my office at the Washington Navy Yard. As I was writing it I got an email from my boss, Mr. James Fenner, the Director of Diving Programs at NAVSEA 00C. The email said, "SUPDIVE, handle this!" It was a naval message from an operational Fleet unit, asking permission to conduct diving operations with a foreign Navy. That is what I do and I love it! My job encompasses other things but helping the Fleet do theirs is the most important. A young and hungry Lieutenant, out on the pointy end of the spear, eager to get himself and his team wet doing the job he was trained to do, sends me a message asking for permission to do it! The only better job I can think of is being on that Lieutenant's team. I lead with that and ask each of you to ask yourself what is it that I do for a living? I'll tell, "You dive!"

"Know your job, be good at it, and take care of your people," words by Admiral Hyman Rickover. I did not know Admiral Rickover but I know what he says is right. Many things have been distracting us all from getting in the water as much as we'd like to but I ask each of you to try hard to get wet as often as you can. We need to be good at diving all the time and in any condition. It is our ride to work. As you come off the mountain tops and out of the deserts, think about that special pay you're getting and then go get better at it! HOOYAH!

Commander Michael Egan, USN
Supervisor of Diving

I love naval history, tradition, and good quotes! I hope that all of you have access to Master Diver Gove's emails of "This Day in Diving History." His pieces are brilliantly timed, well written, informative, and fun to read! Thank you Master Diver Gove for taking lots of your personal time to keep naval diving history alive and for passing it on to us young guys. I want to include naval history, tradition, and good quotes like those provided by the Master Diver in future editions of Faceplate. So send them in!

We are hoping to get a U.S Army Master Diver stationed here at NAVSEA 00C in the Diving Programs office. Once he's feeling comfortable, maybe even slide him into 00C4 Certification for a while. We have been working closely with our Army "Buddies" for years now and I think it is high time that they be represented here at NAVSEA 00C. The Army invited me, Master Diver Stark of 00C3, and Mr. Mike Frey of 00C4 to attend their annual diving conference held at Fort Leonard Wood, MO. I was honored to attend and learned a great deal. I think the Army-Navy team has really found some common ground and hope 2010 is the year SUPSALV gets a Master Diver called "Master Sergeant!" I never did see any water at Fort Leonard Wood though? HOOYAH! Go Army!

SUPSALV will host the 2010 Diver Working Group (DWG) in San Diego, CA from 4-6 May 2010. This year we want as many "Working Divers" as we can get to attend. We want to hear from the Fleet how we can better serve the "Warfighters." This is the best forum to talk through those issues that all Divers have in common and those issues that are unique to your community. I have said this before, we are all Divers and all share the same core diving knowledge and experience. Standing by to support!

HOOYAH Navy Diver!

Never mind that this diver is wearing two watches (one is actually a dive computer) and that he is wearing a wetsuit in the pool. Pools are cold too! Time proves experience and cunning beats youth and good-looks every time! NAVSEA 00C is providing DP-1 training to MDSU TWO Divers at the NSW Combat Swimmer Pool in Little Creek, VA.

ESSM Facility

The Emergency Ship Salvage Material (ESSM) System is a series of facilities that provide ship salvage, pollution control, underwater ship husbandry equipment on an emergency or as required basis, diving equipment, and depot level repair and maintenance on fleet salvage, pollution, and diving equipment for Fleet commands.

ESSM mechanics not only repair the equipment, they train crew members from the Fleet in proper maintenance and repair procedures, which has proven to be very beneficial to Fleet salvors, pollution responders, and divers. Full logistic support is available with command vans, rigging vans, and berthing vans.

There are two ESSM bases located in the United States, both of which carry essentially the same allowance of material, including a complete inventory of ship salvage, pollution control, and underwater ship husbandry equipment. Only the Virginia location provides depot level maintenance on Diver Life Support System (DLSS) equipment.

Presently, there are six ESSM facilities located outside the United States. Their inventories include limited quantities of ship salvage material and pollution control equipment, and are intended for short-term emergency use. Only the Pearl Harbor Hawaii location provides DLSS maintenance outside of CONUS. In both CONUS and OCONUS, all material is stored and maintained in ready-for-issue condition by a commercially contracted manager and support personnel. The Supervisor of Salvage (00C) controls all issuance of all ESSM base material.

ESSM Services

Pollution and Salvage

The ESSM system provides the fleet with salvage and pollution abatement equipment to augment their organic equipment or provide specialized equipment not normally carried in their allowance. Examples of specialized ESSM equipment include reverse osmosis water purification units for making water potable; fly away deep ocean salvage systems, heave compensating lift systems, communications vans, lift bags, and portable command vans. Pollution equipment includes open ocean booms and skimming systems, specialized inland and arctic response systems, floating storage, and pollution offload lightering systems.

Pollution and Salvage Materials in ESSM bases and ESSM complexes are typically contingent items for emergency use only as required by the requesting activity. The materials are not intended for stock replenishment of Fleet units or shore facilities for their routine operations. Prerequisites for obtaining ESSM equipment differ with equipment categories and requesting activities.

Underwater Ship Husbandry

NAVSEA 00C5 has assembled and maintains a collection of specialized fly-away equipment that is not frequently used by individual activities, but is required for a variety of UWSH repair operations. This equipment is managed and maintained in our ESSM warehouses. The equipment is available to U.S. Navy Regional Maintenance Activities for the conduct of waterborne repairs to Fleet units. This equipment supports repairs such as:

- ☐ Hull welding (wet and dry chamber)
- ☐ Hull inspections including underwater photography and video documentation
- ☐ Monoblock and controllable pitch propeller replacement and repair
- ☐ Propulsion shaft and bearing repairs
- ☐ Auxiliary propulsion unit (APU) and secondary propulsion motor (SPM) repairs
- ☐ VLS Cable Repair
- ☐ Surface ship and submarine sonar dome repair
- ☐ Cathodic protection inspection and repairs
- ☐ Painting and fairing
- ☐ Fin stabilizer repairs
- ☐ Submarine retractable bow plane and VLS cable repair
- ☐ WSQ-9 sensor and cable replacement
- ☐ Main ballast tank patching system

Diving

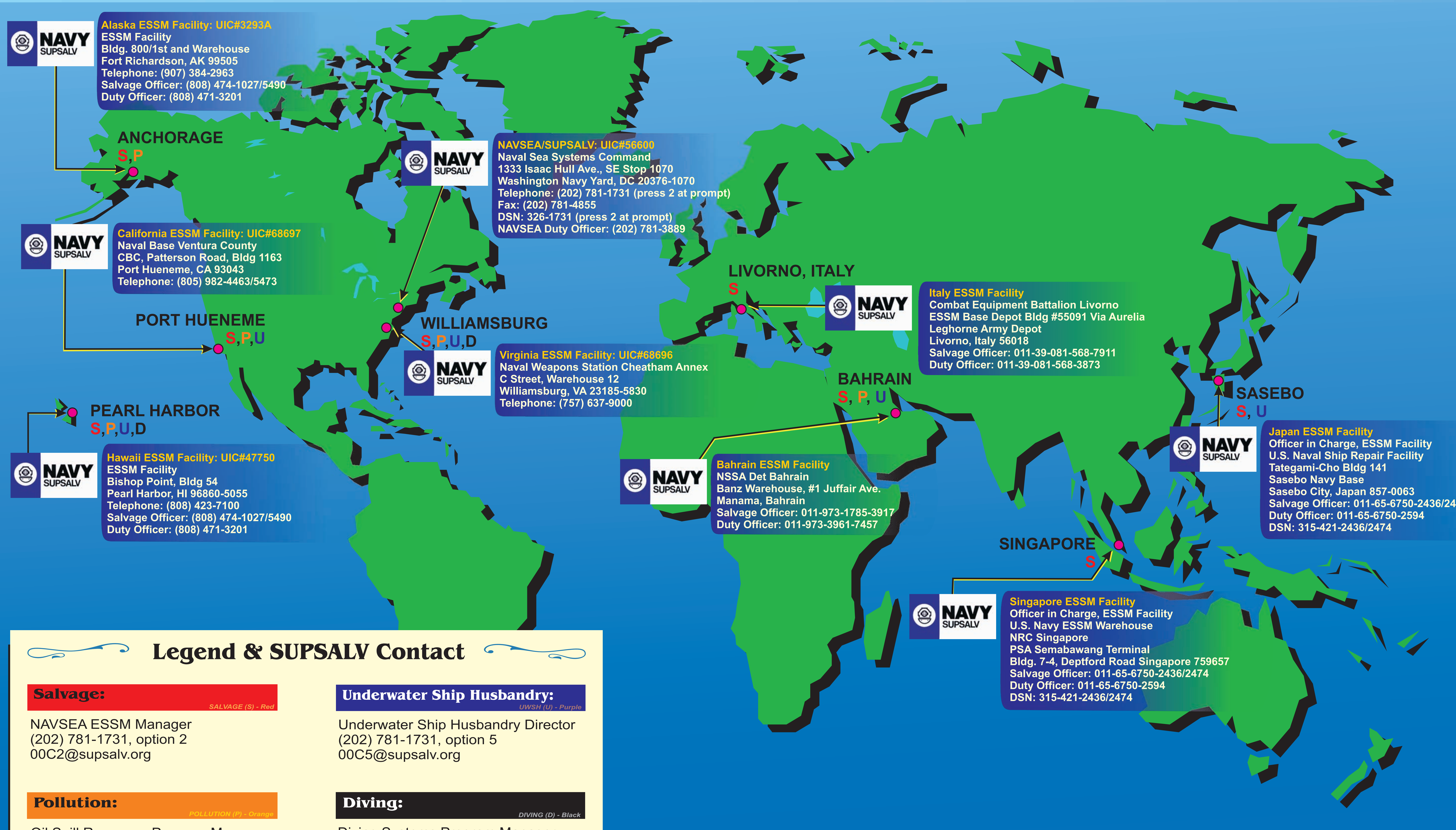
NAVSEA has established a diving depot at the Emergency Ship Salvage Material (ESSM) facilities at Williamsburg, VA and Pearl Harbor, HI for intermediate and depot level maintenance of diver life support systems (DLSS). These facilities meet the need for quality, timely maintenance and repair capabilities for DLSS.

Where ESSM facility does not have a needed capability they have the ability to contract out for the needed work. Specific depot level maintenance capable of being performed at the Cheatham Virginia ESSM facility includes:

- ☐ Hydrostatic test of cylinders, flasks , volume tanks, and filter housings.
- ☐ Clean DLSS systems and components to MIL-STD 1330D.
- ☐ Repair/adjustment of MK 21 helmet regulator and helmet shell fiberglass repairs.
- ☐ Gauge calibration for both air and O_2 gauges.
- ☐ Repair of HYDROCOM diver communication boxes.
- ☐ Assembly, repair, and testing of diver umbilicals and system hose assemblies.
- ☐ The ESSM facility in Pearl Harbor can support hydrostatic testing and maintains an O_2 clean room for cleaning of system components.

For additional information on how to request equipment from ESSM, go to http://www.supsalv.org/essm

EMERGENCY SHIP SALVAGE MATERIAL (ESSM) SITES



Legend & SUPSALV Contact

Salvage: SALVAGE (S) - Red

NAVSEA ESSM Manager
(202) 781-1731, option 2
00C2@supsalv.org

Underwater Ship Husbandry: UWSH (U) - Purple

Underwater Ship Husbandry Director
(202) 781-1731, option 5
00C5@supsalv.org

Pollution: POLLUTION (P) - Orange

Oil Spill Response Program Manager
(202) 781-1731, option 2
00C2@supsalv.org

Diving: DIVING (D) - Black

Diving Systems Program Manager
(202) 781-1731, option 3
00C3@supsalv.org

http://www.supsalv.org/essm

2010 DWG

DIVERS WORKING GROUP

04 - 06 May
San Diego, CA

DAY 1

- Kick-Off
- NAVSEA 00C Opening Remarks
- MCPON (TBD)
- Briefs: NEDU, NECC, WARCOM, Detailer/ECM, NDSTC/CEEOD
- Working Group Break-outs (TBD)
- Training Group Break-outs (TDB)
- MDV/CWO Meeting

DAY 2

- Working Groups Brief DWG on Way Ahead
- Working Group Break-outs
- Training Group Break-outs (TDB)
- End of Day Working Group Back Briefs

DAY 3

- Working Groups Finish
- Working Group Present to DWG
- NAVSEA 00C Closing Comments

Registration & Information
https://secure.supsalv.org/

This is a "Working Divers" conference. Bring your working divers and let's continue to improve our efficiency in supporting the "Warfighter".