FACEPLATE

The Official Newsletter for the Divers and Salvors of the United States Navy
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In this Issue...
M/V Lee III Salvage
and Divers and their Rides

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.

Articles, letters, queries and comments should be directed to the Commander, Naval Sea Systems Command, NAVSEA 00C, 1333 Isaac Hull Ave. SE Stop 1070, Washington Navy Yard, DC 20376-1070. (Attn: FACEPLATE). Visit our website at **http://www.supsalv.org.** To view an electronic version of Faceplate in PDF format go to our website and click on the word "Faceplate" located in the left hand column. This link will direct you to our list of Faceplate issues.

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SUPSALV SENDS

The "Salvage Triad". Ever hear of it? It's the bones around which the muscle of the diving and salvage community is built. "Triad" – 'cause like a 3-legged stool, if you take one part away, it doesn't work well. So what are these three foundational elements of the Salvage Triad?

People: Navy Divers…first and foremost.
Platforms: Our salvage ships…the venerable "junk boat fleet."
Equipment: Our specialty "kit"…for both diving and salvage.

Every now and then, it's worthwhile to take internal inventory and see how healthy our Triad is.

People: A new Navy Diver rating (and, as well, an EOD Tech rating) is just around the corner. You've been hearing about it for months, but it is soon to be reality. The Center for EOD and Diving (Capt Windhorst and MDV Wiggins) has been leading the fight on this initiative, and is on the very verge of official victory. But the rest of us can't sit on our laurels…if we ever take for granted that we are as good as our headlines, we'll find out soon enough how mortal we all are. Dive Locker leadership (yeah – I'm talking to you 1C Diving Supervisors) should each take a round-turn on personal leadership, safety, technical training, and procedures. When's the last time you ran a challenging, surprise, never-thought-about-that-happening-before kinda drill? Don't overestimate how far Hoo Yah will carry you. Lead and train.

Platforms: It's true – the ARS 50s are transferring to Military Sealift Command (MSC) (two in FY06 and two in FY07). But they'll still be in the U.S. Navy. And they'll be operated by extremely competent professional mariners who will be going through salvage training side-by-side with our MDSU detachments. In fact, because of MSC policy, each T-ARS will be available for operations for an entire extra quarter each year (270 days vs. 180 days per year)…which at least in terms of operational days is the same as having <u>six</u> vice four ARS 50s. So our inventory of ARS 50s will be more effective. Add that to the T-ATFs, and we retain a strong population of U.S. Navy salvage vessels. Fair enough. But now we need to train in all the many capabilities that the salvage vessels bring to the fight…salvage fire-fighting, debeaching ops, heavy lift, beach gear, multiple-point moors, emergency tows. Got any idea when and how to use the ARS 50 for a tidal lift? Know how to rig for it? Salvage Locker leadership (yeah – I'm still talking to you 1C Salvage Supervisors) should each break out the ship's salvage operations manuals and make sure you know your ships well. They are designed with enormous capability and flexibility and they'll be around for a while. Stand ready to use them.

Equipment: Our salvage ships and MDSUs are outfitted with yellow gear that's up to the tasking, and the USN Emergency Ship Salvage Material (ESSM) Pool is a national asset of specialty equipment warehoused and maintained ready for immediate issue and use. And we're about to undertake a baseline review of our ESSM "inventory objective" (basically…how much stuff we really need). But do we know what all of our issued gear is, and what it's for? When's the last time your salvage team broke out and reeved a pair of 4-sheave blocks? How many of your newly reported salvors could identify a carpenter stopper, know how they're sized and how many are needed for a leg of beach gear? While you're at it, break out a few of the recently republished pocket-sized USN Salvor's Handbooks, and run a few numbers. Do you know where your issue of USN Salvage Manuals is? (Hint – check the SUPSALV Tech Doc CD issued August 2004). The experiences (good and bad) recorded in our Salvage Manuals are based on decades of operations. Although nothing beats personal experience, the second best option is to be able to study lessons learned from someone else's successes and failures.

Our mission requires us to be ready for our Navy and our Nation at a moment's notice…take a local readiness inventory, identify gaps in readiness, and exercise the weaknesses into strengths.

SUPSALV SENDS

In This Issue

Front Cover Photo: *D/B CAPPY BISSO and D/B LILI BISSO completing the lift of the supply vessel LEE III.*

2005 National Maritime Salvage Conference

Mark your calendars to plan to attend the 2005 National Maritime Salvage Conference, sponsored by the American Salvage Association (ASA), November 1 through 3, 2005 in New Orleans, LA.

The first day, Tuesday, November 1, will offer a training seminar focusing on marine salvage, wreck removal, and harbor clearance operations as they relate to port security.

The conference program for Wednesday, November 2 and Thursday, November 3 will include a discussion of maritime security, wreck removal, harbor clearance, firefighting contracting, U.S. salvage regulations and the international view of the salvage industry, incident command structure (ICS), responder immunity, salvage and the environment, places of refuge, training and safety, and more.

Details on the program and agenda can be found at www.americansalvage.org.

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The American Salvage Association is a trade association promoting professionalism and improving marine casualty response in American coastal and inland waters. For additional information contact Dick Fredricks, ASA, (703) 373-2267 or rfredricks@vesselalliance.com.

From the Managing Editor

This issue of Faceplate has a lot to offer. The EOD community has provided material that is current and is a welcome addition to the publication.

For those of you who are planning a new or second career in Diving and Salvage, the article “Transition into Commercial Diving” on page 16 will be of particular interest. There is also a notice of the National Maritime Salvage Conference, November 1 through 3, in New Orleans, (see above). The ASA membership consists of all of the major Salvage and Diving Companies in the United States. You will note that the current and all former Supervisors of Salvage are Associate Members. If you want to meet the key players in Salvage and Diving, this conference is a must. I hope to see many of you in New Orleans.

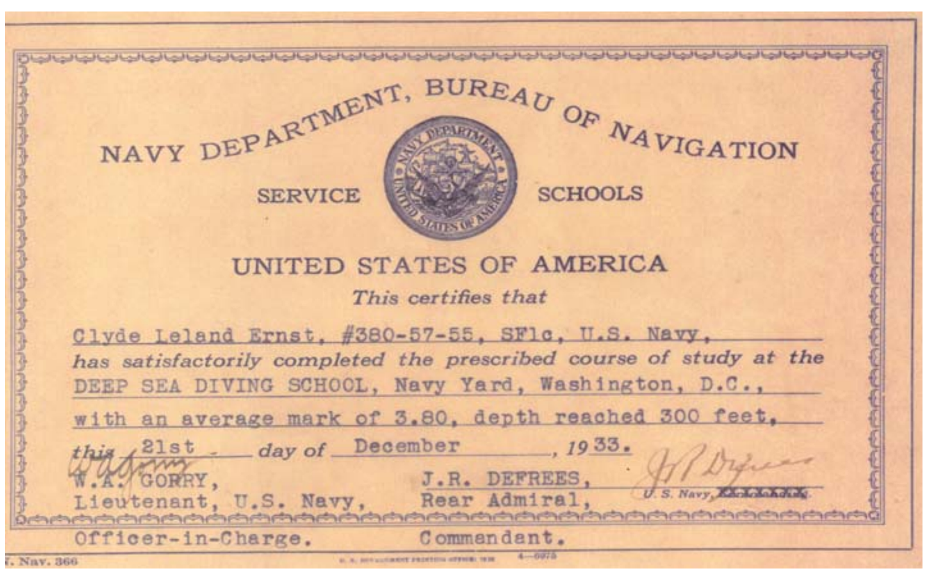
I am happy to report that your contribution of articles has been superb. At present, we have a backlog. Your article, if selected, will be published in a future edition of Faceplate. Again, thank you for your support.

Jim Bladh

To the Managing Editor from SUPDIVE

In the August 2004 issue of Faceplate, Jim Bladh challenged Divers out there to provide an older Dive School certificate. Here is one from Clyde Ernst from 1933!

Captain Mark Helmkamp, SUPDIVE



NAVY DEPARTMENT, BUREAU OF NAVIGATION
SERVICE SCHOOLS
UNITED STATES OF AMERICA
This certifies that
Clyde Leland Ernst, #380-57-55, SF1c, U.S. Navy,
has satisfactorily completed the prescribed course of study at the
DEEP SEA DIVING SCHOOL, Navy Yard, Washington, D.C.,
with an average mark of 3.80, depth reached 300 feet,
this 21st *day of* December, 19 33.
W.A. GORRY, Lieutenant, U.S. Navy, Officer-in-Charge.
J.R. DEFREES, Rear Admiral, U.S. Navy, Commandant.
Nav. 366

Diving Requalification

By: LCDR Mike Foster

I recently completed diving requalification at the Naval Diving and Salvage Training Center (NDSTC) and felt that it might be of value to others if I put down my experience in writing. This article summarizes my AT conducted at the Dive School to regain my qualification which had lapsed when I was honorably discharged from active duty in 1994.

Diving requalification must be performed in accordance with MILPERSMAN 1220-260.

When the member's diving qualification has lapsed for more than 3 years, the diver must successfully complete the physical screening test described in MILPERSMAN 1220-170 and successfully retake the following portions of the diving course that would bestow the diving qualification desired. All classroom portions relating to diving physics and/or general diving procedures, and portions relating to diving medicine, practical portions relating to recompression chamber operations, and practical portions relating to diving equipment in which the individual has not been previously trained.

For me this meant taking the computer-based interactive course in Diving Physics and Medicine, and refresher courses in the MK 20 MOD 0, MK 21 MOD 1, and Mixed-Gas Diving. These and other courses are available in the schoolhouse computer lab, and they require at least an 80% on the comprehensive final exam, after which a certificate is available to be printed. A copy should be provided to the NDSTC Training Department Fleet Master Diver for entry into your record.

The following are the Navy Diver physical screening test requirements. See the NDSTC website or MILPERSMAN 1220-170 and MILPERSMAN 1220-100 Exhibit 1 for the details of performing each exercise properly as, while I found the staff and instructors at NDSTC to be very professional and accommodating, exercises performed improperly will not be counted.

1. Swim 500 yards non-stop utilizing the side or breaststroke in 14 minutes followed by a ten-minute rest period.
2. Perform 42 push-ups in 2 minutes followed by a two-minute rest period.
3. Perform 50 sit-ups in 2 minutes followed by a two-minute rest period.
4. Perform 6 pull-ups with no time limit followed by a ten-minute rest period. (Note that you cannot let go of the pull-up bar once this exercise begins.)
5. Run 1.5 miles in 12 minutes 45 seconds.

To perform the test, I was placed with two classes that started the day I checked in on AT, these were a BDO (Basic Diving Officer) class and a 2nd Class Diver class. At 44 years old, the physical screening test was the most challenging part of requalification. Especially considering that I was, by far, the oldest person performing the test, and that most of the other participants were less than half my age!

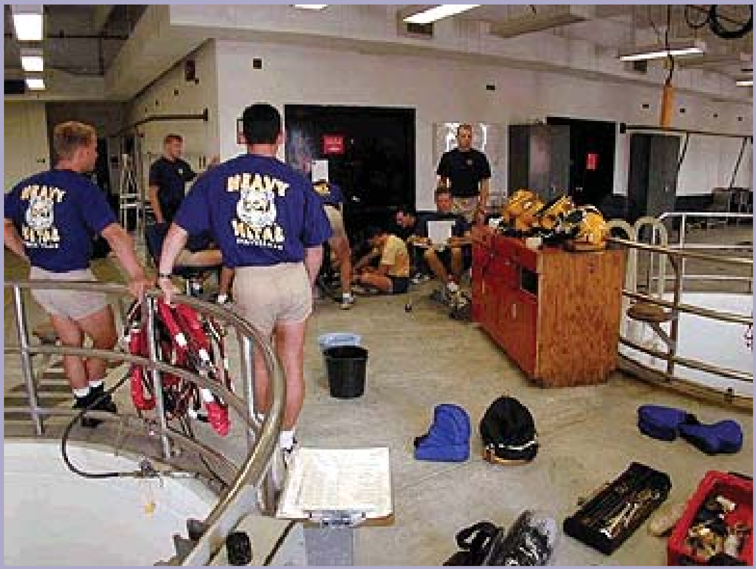
I offer a word or two of advice here, if you are not already in peak physical condition, start a "high volume" physical fitness program at least 6 months prior to going for requalification. I was three pounds overweight by Navy standards in late 2003 and I worked out nearly every day for 6 months losing over 20 pounds with a program that included cardiovascular training (NordicTrack and swimming), running, calisthenics, weightlifting, and proper nutrition. My program paid off tremendously in many ways, and I passed the test with no problems.

Another critical area for requalification is that of the Diving Medical Examination. I am not a DMO (Diving Medical Officer) so I do not claim to know all of the nuances of this specialty, but based on my experience, I was required to undergo a complete physical examination, which had to be marked "for duties involving diving", and it then had to be reviewed and approved by a DMO prior to my arrival at NDSTC. This was by far the most important requirement, as the last thing you want to have happen is for you to show up at the Dive School only to find out that you are "NPQ" (not physically qualified) due to medical reasons.

I recommend that you start the medical process at least three months prior to going for requalification, and work closely with a DMO to identify the requirements that must be met. I was fortunate enough to be in close proximity to the NAVSEA 00C DMO located at the Washington Navy Yard. He reviewed my medical exam, and even called the Dive School DMO to verify that all of the requirements were met. This was an excellent way to go, as I knew before arriving in Panama City that I was medically "PQ."

Once I had successfully completed all of the prerequisites, it was simply a matter of reporting aboard NDSTC and working with the Training Department to perform my four required requalification dives. Note that requalification dives must be performed in accordance with MILPERSMAN 1220-100 Exhibit 5, and the U.S.

MK20 Pier Side Diving.


MK21 Open Tank FAM Dive.

Navy Diving Manual. I was fortunate in that there were two 2nd Class Diver classes in progress at various stages of their training, so I was able to fulfill all of my requalification dives in a few days. I should give credit to 04-40-2C and 04-50-2C by name, as both of these classes were exceptionally professional and cohesive diving units. We also received extensive help and training from 04-20-1C, 04-50-1C, and many others. It is nice to witness first-hand that Navy Divers are still "a cut above." Bravo Zulu to all of you!

I started out with two MK 21 dives in the open tanks, which allowed me to regain familiarity with this equipment. I then joined up with another "2 chuck" class, diving for several days aboard one of the two YDTs (Yard Diving Tenders) that the Dive School maintains. I was able to get several surface supplied air dives in the MK 21, as well as a mixed-gas HEO_2 dive in the MK21, including a Sur-D O_2 dive, which gave me some time in the YDT's recompression chamber. Then I moved back to the other "2 chuck" class and was able to dive the MK 20 pier side.

My NDSTC-issued Performance Information Memorandum is for requalification as a Mixed-Gas Diving Officer certified to a depth of 190 fsw. The school dives a variety of equipment almost every day so you are sure to find the requalification level you are looking for. Per MILPERSMAN 1220-260, diving qualification extends for a period of 6 months, so take this into account for your next requalification.

My time spent at NDSTC was extremely valuable as I regained skills that I had not used in many years, rekindled some old friendships (some of the junior officer and petty officers I knew back in the late 80's and early 90's are now the CO, Master Divers, and senior CPOs at the Dive School), and I know that 10 years from now I'll look back on my diving requalification with fond memories. Requalification also allows me to fulfill a billet with my reserve unit, NR NAVSEA Det 1006, which is a Washington, DC reserve diving detachment assigned to NAVSEA 00C.


MK21 with EGS Up and Over.

More information on NDSTC and diving requalification can be found on the NAVDIVSALVTRACEN website at: http://wwwnt.cnet.navy.mil/ndstc/.

P.S. NDSTC celebrated its 25th anniversary in Summer 2005. If you haven't been there in the past few years, I recommend that you pay them a visit. The school has added several new wings and now hosts the Center for EOD and Diving and the Marine Combatant Diver (MCD) program. They conduct more than 20 training courses graduating over 1,300 divers a year, and they welcome alumni with open arms.

Thanks and a hearty HOO-YAH to the instructors, staff, and students at NDSTC!

LCDR Mike Foster is the TO/PAO at NR NAVSEA Det 1006.

Underwater Post-Blast Course

By: Special Agent Bobby Chacon, FBI

A super-tanker is moored offshore at an offloading facility delivering fuel to the thirsty automobiles of Southern California. The facility is located in the Pacific Ocean - a short distance off the runways of Los Angeles International Airport.

As the tanker is offloading fuel, a commuter pulled over along a nearby roadside observes several men unloading a small motor boat from a trailer parked illegally along the beach. He watches as the boat speeds out to sea in the direction of the tanker.

A short time later he sees an explosion off shore, and notifies the authorities using his cell phone. Authorities determine that the tanker has not been hit but there is some debris on the surface of the water in the area pointed out by the first witness, whose story is later corroborated by the statements of other witnesses. It is quickly determined that a vessel has exploded but the circumstances are unknown. All activity at the fueling station is halted, as is incoming traffic at the nearby Port of Los Angeles/Long Beach. Air traffic at LAX is interrupted. Authorities at large commercial ports all around the country are notified and placed on high alert.

The first class to graduate The Underwater Post-Blast Investigation Course.

A thorough and proper underwater investigation needs to commence immediately in order to re-open the fueling station and return the ports and airports to normal operating conditions.

Terrifying Precedent

Despite the significant resources and attention that are focused on port security today, the above scenario – taken from a training scenario based on the USS THE SULLIVANS and USS COLE incidents in Aden, Yemen - cannot be overlooked. This tactic has been tried repeatedly and has been proven effective, suggesting it will likely be tried again.

Kelly Sandell (left) Los Angeles Police Department Dive Team and Bob Scheerle (right), FBI Los Angeles Dive Team watch as Instructor Greg Everett (center) of the Los Angeles Sheriff's Department Arson Explosives Detail offers insight into the operation of the exploded IED using items located and recovered by Sandell and Scheerle's team of student Divers.

Should a similar attack occur again, the ensuing underwater investigation will need to quickly determine several very important things:

1. Was the explosion of the small boat an innocent accident, or did it result from explosive materials intentionally placed onboard the vessel?
2. Did the operators of the vessel intend to attack the super-tanker?
3. What type and quantity of explosives, if any, were aboard the vessel?
4. What type of device was intended to trigger the explosion at the tanker?

These and many other questions will be asked in the aftermath of such an incident, and their answers demanded quickly.

Preparting Dive Teams for Major Investigations

Law enforcement dive teams must be trained and equipped specifically for this type of complex underwater crime scene investigation. This was the idea behind a first-of-its-kind course developed and taught jointly by bomb technicians from the Los Angeles Federal Bureau of Investigation (FBI), Los Angeles Police Department Bomb Squad, Los Angeles Sheriff's Department Arson Explosives Detail, and the U.S. Navy Explosive Ordnance Disposal (EOD) Unit at Point Mugu, California.

Students reassemble the components of an underwater exploded IED in the hope of determining its mechanism of action, on the way to identifying the perpetrator. Information is fed into a computer for a later presentation to a prosecutor who assisted with the class.

The week-long course was piloted October 4-8, 2004 at Castaic Lake, California. During their course planning, instructors recognized that, while many public safety divers are well-trained in the processing of routine underwater crime scenes, most lack a robust training curriculum or certification for the specialized skills associated with major underwater crime scenes like those resulting from the use of an explosive device.

The course would partner public safety divers with diver/bomb technicians so that evidence collected or located by divers could be quickly and adequately analyzed by the bomb techs – both in the water and along shore – in order to advance the work of the investigators and resolve the situation.

Attending the 40-hour course were public safety and military divers from agencies including the Los Angeles Police Department, the Los Angeles Sheriff's Department, the FBI, the Orange County Sheriff's Department, and the United States Coast Guard (USCG).

Classroom Training and Field Work

During the course divers were introduced to concepts related to underwater bomb scenes through both lecture and practical exercises. The lectures provided an introduction to basic underwater explosives theory, training on the recognition and identification of manufactured limpet and sea mines as well as improvised explosive devices (IEDs), an introduction to DC electronics commonly employed in IEDs, and crime scene management. Divers were also introduced to an overview of skills used in post-blast fragmentation analysis.

By Tuesday afternoon the divers were in the water applying what they had learned in the classroom. Divers from several different agencies and departments were purposely placed together in teams of six to eight in order to foster inter-team working relationships. Over the next three days the divers were put through a series of exercises of increasing complexity leading to the final, all day scenario.

The LASD ROV is deployed from the beach in search of items of evidence lying on the lake-bed.

On Wednesday each of the four teams was given an underwater area to search for evidence of an exploded device. Course instructors had detonated a series of IEDs underwater in a controlled environment (a large concrete tank) prior to the class. The location and pattern of debris was recorded for each device and items of evidence (fragmentation) were placed into the lake in the exact condition and pattern they had taken when exploded in the controlled environment.

Each team was then tasked with locating the exploded device and its components. The teams were required to process the device components distributed across the bottom as though they were working a real crime scene. They used video and still photographs where visibility would permit, and documented debris patterns through a sketch on an underwater slate – a drawing that might later prove crucial to bomb technicians conducting the post-blast fragmentation analysis.

Finally, after the documentation and recovery phase of the operation, the teams then took the evidence into the classroom lab, where they were required to develop a reconstruction of the device from the recovered components and to describe the manner in which it had functioned, causing the explosion. During this phase of the course the divers learned valuable lessons on approaching such an underwater crime scene, as well as what to look for and how to handle, recover, and analyze it. Not only is each item important, but its location and position relative to the other items is also extremely relevant to the reconstruction of such devices. The teams presented their findings to the instructors and class, with their conclusions supported by recovered items of evidence as well as appropriate and logical analysis.

A Simulated Attack

On the final day, the divers arrived at the site and were immediately confronted with several witnesses who began to outline the details of the scenario described at the beginning of this article. With only general prompting from the instruction staff, the divers were required to set up a multi-agency "Unified Command" and begin the process of assigning tasks and meeting the requirements of the scenario – as though it were a real crime scene.

Dive Teams raise the suspect's boat utilizing lift bags. The boat had been surveyed and videotaped by the ROVs prior to the student divers processing it on the lake bottom. Once all underwater crime scene processing was completed by Divers, the boat was recovered for further examination.

Since the divers did not know the exact location or condition of the sunken boat described by witnesses, the team leaders decided to organize an underwater search operation based on witness information. During the search, teams launched two ROVs operated by the Los Angeles Sheriff's Department and the FBI Underwater Search and Evidence Response Team. Divers eventually located the sunken boat using a Kongsberg-Simrad 650 sector scanning sonar deployed aboard the FBI's Deep Ocean Engineering Phantom 2+2 ROV.

After locating the sunken boat, the Phantom ROV was used to conduct a video survey of the boat and the surrounding area. By beaming the video image topside to the team's support vessel, the team was able to determine that the vessel was laden with additional, undetonated explosives, and that there was at least one victim still onboard.

After conferring with bomb technicians who were viewing the ROV's video topside, the team used the ROV's manipulator arm to recover what appeared to be one piece of explosive material that had been thrown clear of the vessel during the explosion.

The ROV then returned to the surface. While the bomb technicians examined the unexploded material, the divers reviewed the ROV's videotape and telemetry data and formulated a dive plan to recover the victim, process the scene, and recover the explosive material and the boat.

The ROVs proved extremely valuable in providing an accurate and detailed site survey to the divers, as well as in serving as a remote means of recovering potentially hazardous materials and devices – including two unexploded backpack-borne IEDs that presented an obstacle to dive operations and needed to be rendered safe prior to divers entering the water.

FBI Dive Team members operate the Deep Ocean Engineering Phantom 2+2. The ROV utilized its Kongsberg 650m sector scanning sonar and video camera to locate the sunken boat described by witnesses.

During the IED recovery operation, the ROV were used to attach cables to the devices. The cables were used to drag each backpack near shore, where bomb technicians were able to retrieve the cable end, while the IED was safely underwater at the opposite end of the cable. The IED was then examined by a waiting PAN disruptor; a device developed by bomb-disablement expert Chris Cherry in the early 1990s to help keep bomb technicians safe and disable bombs non-explosively so that valuable evidence can be retained.

The divers then executed a dive plan to recover the victim, the unexploded material, and the boat. Still photographs and sketches were used to further document the scene and the locations of relevant items of evidence.

Finally, the divers used lift bags to raise the vessel and had it towed to shore, where a more detailed examination of the blast damage could be conducted.

Improving the Curriculum for Future Courses

Overall, both instructors and students believe this pilot course was a success and were very happy with the level of instruction that was provided. Instructors have already begun with modifications to the existing curriculum in order to take into account the comments of students who attended the first course.

If you have any questions about the course or are interested in attending, please contact FBI Los Angeles Special Agent Bomb Technician Greg Rabinovitz (grabinov@leo.gov), Special Agent Robert Chacon (robert.chacon@ic.fbi.gov, 310-996-4397), FBI USERT Team Leader Special Agent George Carr (geoccarr@earthlink.net, 818-779-3190), or Los Angeles County Sheriff's Department Detective Bomb Technician Greg Everett (562-946-7222).

Special Agent Bobby Chacon is an Assistant Team Leader for the FBI's Underwater Search and Evidence Response Team.

Naval Undersea Museum

By: Bill Galvani

One Sunday morning at the Naval Undersea Museum in Keyport, Washington, a four-year-old boy raced ahead of his father, turned a corner, and let out a cry: "A monster!" He dashed back to the safety of his father's arms. Together they ventured around the corner where his Dad found the museum's display of a MK V diving rig, complete from helmet to canvas dress to heavy shoes. When you are four years old, not too tall, and all alone, a sudden encounter with fully rigged Jake can make a big impression.

Helmets representing more than 100 years of diving heritage attract visitors to a photo exhibit of modern Navy diving.

Opened in 1993, the Naval Undersea Museum collects, preserves, and interprets all aspects of Navy undersea heritage, science, and operations. Its exhibit floors and storage areas hold more than 15,000 undersea artifacts, and the library has more than 6,000 books, technical manuals, and photographs. It is an official U.S. Navy museum and has achieved accreditation by the American Association of Museums.

Diving is one of the museum's most important interests, and visitors will find diving exhibits everywhere inside and outside. In the lobby, two larger than life gleaming silver silhouettes depict a man and woman swimming into the deep. They point toward a grotto. One side of the grotto displays the materials from animal skins and wood to plastics and composites that have improved diving technology. On the opposite side, a timeline depicts more than 2,000 years of diving and undersea heritage.

The Ocean Environment room challenges visitors to think about characteristics of the ocean that divers know by heart: buoyancy, pressure, oxygen, light, and sound. The blue and green lights bathe visitors in the colors of the upper ocean. Interactive exhibits challenge them to experiment with the physics of movement in the sea.

The Ocean Environment exhibit helps visitors understand pressure, buoyancy, temperature, salinity, and other characteristics that divers routinely encounter under water.

On the main exhibit floor is a display of nine significant diving helmets, beginning with a Snead from 1906 and continuing chronologically to the modern Superlite 17. Surrounding the helmets is an exhibition of 20 large photographs, most in color, of divers at work. In a photo of a diver working on the hull of USS CHARLESTON in 1888, a helmet prevents us from seeing the expression on the diver's face, but the Navy SCUBA divers leaping into the sea in Diego Garcia in 2004 are obviously having a good time.

Appropriately, the largest single artifact in the museum is a Submarine Rescue Chamber. Two large cutaways in its hull let visitors see the operating mechanisms and cramped quarters that permit the SRC to bring people to the surface in times of distress.

The museum is not all diving exhibits, but it did win the Nautiek Award from the Historical Diving Society of England in 2000 for having done the most to promote the public's knowledge of diving history. The museum offers extensive exhibits about the ocean environment, naval undersea weapons such as torpedoes (ten are on display), submarine technology, and mine warfare.

Outside the main building visitors can see DSV I, DEEP QUEST, the sail from USS STURGEON (SSN 637), and the end bell from SEALAB II.

The museum is currently developing a major new diving exhibit about the people, work, and techniques of the USS MONITOR salvage in 2000 and 2001. It continually seeks items both old and new connected with diving heritage, important events, or everyday common use.

The museum is open from 1000 to 1600 seven days a week June through September. From October through May it is open 6 days a week and closed on Tuesdays. Admission to the museum is free. People wishing to make donations or to get more information about the Naval Undersea Museum may call the curator at (360) 398-5517 or visit the website at http://naval.undersea.museum.

Bill Galvani is the Director of the Naval Undersea Museum in Keyport, Washington. Photo credit - U.S. Navy photo/Joyce Jensen.

SSN 688 Class: Diving Restrictions Revised
Diving Within 50 Feet of Active Sea Suctions

By: LCDR Onofrio Anastasio and CWO Rick Strynar

For years U.S. Navy Divers have been performing critical waterborne maintenance on nuclear submarines. Their abilities to accomplish these jobs have saved the Navy millions of dollars in avoiding drydock costs alone. Great timesavings that directly improve operational readiness are also generated. Reduced budgets and increased operational tempo have forced Naval Sea Systems Command (NAVSEA) to look at all maintenance activities and processes to ensure further efficiencies and cost savings. One process identified for such improved efficiencies is that of diving near active main and auxiliary seawater suctions of SSN 688 Class nuclear submarines.

Divers retrieving NEDU man-weighted manikin following unmanned testing phase.

The U.S. Navy Diving Manual specifies that diving within 50 feet of an active sea suction greater than 50 gal/min and located on the same side of the keel is not authorized unless it is an emergency; in such a case, the Commanding Officers of both the repair activity and tended vessel must authorize the dive. This restriction was developed following numerous diving accidents that had resulted in serious injury or death. However, when this restriction was developed, no consideration was given to the size of openings or to flow rates.

Normal ship husbandry jobs and security swims are non-emergent. Under current guidance, waiting for equipment lineups to be completed and red tags to be placed and verified costs many man-hours for not only divers, but also supporting personnel. To become more efficient and to improve operational readiness, naval engineers have looked closely at this restriction against dives near active main seawater (MSW) and auxiliary (ASW) suctions of SSN 688 Class submarines. Engineers, including Navy Diver LCDR Keith W. Lehnhardt at Portsmouth Naval Shipyard, calculated that diving in the vicinity of active MSW/ASW sea suctions, even when these are greater than 50 gal/min, does not pose a safety threat to divers. Although the flow rates of these suctions far exceed 50 gal/min, their openings are so large that the actual flow and pressure differential across the grate is low.

NSSF diver EN1 (DV) Andros prepares to leave surface to approach active sea suction.

NAVSEA 00C tasked the Navy Experimental Diving Unit (NEDU) to verify these calculations and evaluate the feasibility of diving around active MSW/ASW sea suctions. Designated as Project Officers for this task, CWO3 Rick Strynar and LCDR Neff Anastasio drafted a protocol for unmanned and manned diving. Once completed, it was sent to various ship husbandry lockers for review and support. With the help of Diving Officer CWO3 Dan Mikulski of the Submarine Force, U.S. Atlantic Fleet (COMSUBLANT), the Naval Submarine Support Facility (NSSF) Groton Dive Locker and the USS MIAMI (SSN 755) were scheduled as platforms to execute the protocol.

This protocol consisted of two unmanned and one manned phases. The first phase entailed attaching a differential pressure gauge to the suction screen, starting the MSW/ASW pump, and recording pressure readings. Recorded readings were then compared to the engineering calculations. Results showed that actual readings were slightly less than the predicted values. The second phase consisted of placing NEDU's manned weighted manikin — dressed in standard underwater ship husbandry attire, including a MK 20 underwater breathing apparatus (UBA) — over a sea suction, running the pump for 5 minutes, and checking the manikin for signs of suction damage. This phase was conducted three times, with the manikin positioned differently over the grates each time to maximize grate coverage. After the three dives, this manikin showed no adverse effects from being placed over the grates.

Satisfactory results from the first two phases allowed testing to continue to the third phase, in which one MK 20 and two MK 21 divers slowly approached the active suction screen and placed themselves over it. CWO Strynar and NSSF Master Diver ENC (MDV) Rodney Atherton, with ETC (DV) Christopher Weaver as dive supervisor, led this high-risk evolution. Divers for this task were HT3 (DV) Michael Fuzy, HT1 (DV) Brian Wurm, and EN1(DV) Timothy Andros. PH2 (DV) Christopher Staten, HT3 (DV) Adam Cook, OS3 (DV) John Seagraves, QM2 (DV) Nikki Knoepfle, and TM3 (DV) Paul Melchert provided topside support. The Commanding Officers of NSSF Groton and USS MIAMI, as well as LCDR Anastasio, acted as safety observers for the evolution.

The SSN 688 suction dive team.

Recovering HT1 (DV) Wurm following dive at active sea suction.

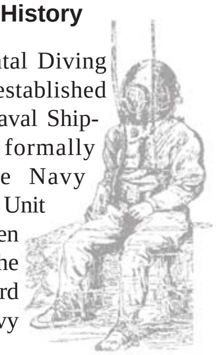
One at a time, each diver was directed to approach the active suction. Once at the screen, they were directed to place their hands, arms, legs, and then torsos over the screen — and then to remove them. Divers reported that little to no water movement was evident and little to no additional effort was required to perform directed tasks. Results were recorded and provided to NAVSEA 00C for review and action. In the near future NAVSEA 00C will release an AIG outlining guidelines and procedures to allow diving around submarine active MSW and ASW suctions.

This evolution required outstanding coordination between the Commander of the Atlantic Fleet (COMLANTFLT), COMSUBLANT, NSSF Groton, and NEDU. The endeavor was well worth the effort: the results of this testing will save the Navy hundreds of man-hours and millions of dollars in accomplishing submarine maintenance and security swims.

LCDR Neff Anastasio is currently the NEDU Senior Projects Officer. CWO3 Rick Strynar is the currently the NEDU Command Diving Officer and Fleet Projects Officer.

Mark V Monument at the Washington Navy Yard

A Brief History



An Experimental Diving Organization was established at the New York Naval Shipyard in 1913 and formally designated as the Navy Experimental Diving Unit (NEDU) in 1927 when it was relocated to the Washington Navy Yard to centralize all Navy Diving research.

The Navy Diving School was established in 1926 in Building 146 at the WNY and was renamed Deep Sea Diving School (DSDS) in 1928. The Navy Salvage School was moved to the WNY from Bayonne, NJ in 1957.

NEDU relocated to Panama City, FL in 1975 and the Diving School followed in 1980. There is currently nothing at the Washington Navy Yard that tells this history. The Mark V Monument we plan to erect there will change this.

Donation Request

This monument is dedicated to Divers from around the world who gave their life's work to underwater construction and the salvage of ships lost at sea. Their method of training and development of equipment set standards adopted by the international diving community. Their traditions will last forever.

Please accept this opportunity to support this project in remembrance of the unsung heroes who labored in the murky depths to save lives and improve knowledge of the world underwater.

Please send your tax-deductible contribution to:

Mark V Monument
17314 Panama City Beach Pkwy
Panama City Beach, FL 32413

A certificate of appreciation will be mailed to each donor. Please make check payable to "Mark V Monument."

Contact Bob Barth at bob.barth@mchsi.com or Doug Hough at (850) 235-4101 or momits@bellsouth.net if you have any questions.

Your support is greatly appreciated by everyone in the Navy Diving community!

Divers And Their Rides

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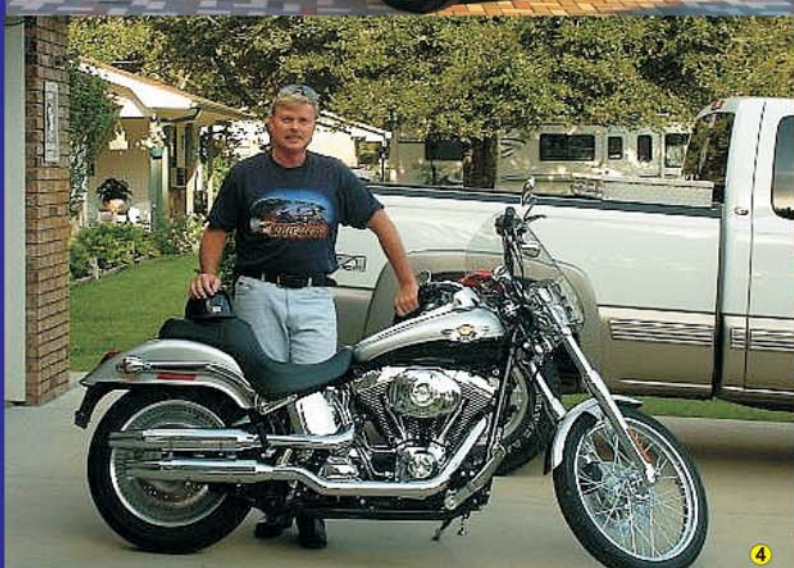

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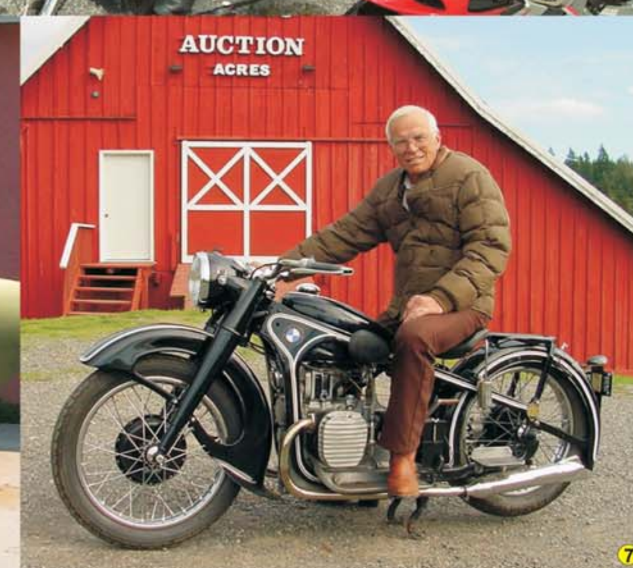

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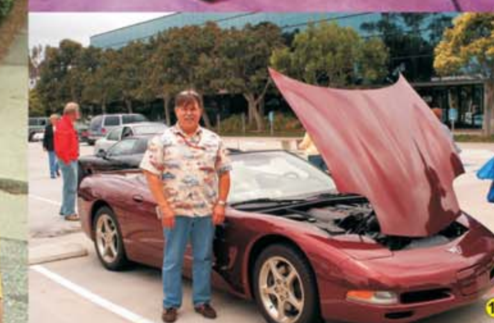

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Divers And Their Rides

Transition into Commercial Diving

By: John Paul Johnson

Your EAOS is approaching. You have been wondering what you are going to do for a second career after the Navy. Whether you plan to leave with less than six years or will be retiring with 20 or more years, commercial diving may fit into your plans. If you have graduated from a Navy diving school as a Second Class or First Class Diver, the commercial diving industry may be your ticket for continued employment in your chosen field.

While commercial diving is a unique, diverse, and independent industry known to few outsiders, the industry itself comprises two distinct employment areas: Inland Diving and Offshore Diving.

Inland Diving is performed in coastal and inland waterways, lakes, bays, sounds, harbors, and other shallow coastal areas. Most of this work is done in less than 100 feet of water and uses air diving procedures. Bridge and dam inspections, municipal water towers, power plants, ship hull repair and cleaning, and pipe and cable inspections are but a few of the many different types of work done by inland divers.

Inland diving work is primarily related to the construction trades. Work is steady and the entry level diver utilizes his or her own individual construction skill sets to support the contractor's requirements. Nationally based underwater contractors allow a diver to work closer to home. Entry level divers enjoy an earlier "break-out" (less time spent as a tender).

Pay varies with geographical locations and upward mobility may be limited. Weather conditions in northern climate may limit work on a year-round basis. Work sites in remote areas have limited logistical support.

Offshore Diving primarily supports the oil and gas industry and is concentrated in the waters off Louisiana and Texas. These states provide over half the commercial diving opportunities in the United States. Offshore diving is performed in depths ranging from a few feet to over 1,000 feet. Deep diving requires substantial sophisticated surface support equipment operated by well-trained crews consisting of topside support personnel and technicians. The diving is performed by divers, usually in their late twenties to mid-thirties, using helium and oxygen mixtures for deep diving. However, a considerable account of offshore diving is done in water less than 180 feet using standard surface-supplied air diving techniques.

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Offshore work schedules range from three-day jobs, up to three weeks to three months or longer. Most large-scale diving companies provide (free) berthing and messing on boats, ships, or barges. Work is normally divided into 12-hour shifts seven days a week with time and a half for overtime over 8 hours.

The pay is higher after a diver "breaks out", this includes depth pay. Divers have a better chance of employment longevity with an established diving contractor. Upward mobility provides the diver a chance to gain the experience to dive mixed gas leading up to saturation diving. Other positions available to divers are Life and Saturation Support Technicians, while supervisory and management positions are more readily available. Most divers working in the support of the oil and gas industry usually relocate to the Gulf states.

The pay for entry level divers is generally lower and the initial break-out period is longer with offshore diving than with inland diving. Work schedules are arduous and can impact family life.

What are the training requirements to qualify as a diver recognized by the U.S. Coast Guard and the Occupational Safety and Health Administration (OSHA)? In the United States, there are two recognized standards:

- The American National Standards Institute/American Commercial Diving Educators (ANSI/ACDE) Standard 01-1998 and
- The Association of Diving Contractors International (ADCI) Standard Consensus Standard.

Both of these organizations issue certification identification cards that are acceptable proof of adequate training and experience that meet OSHA's Test of Competency. For the most part, if you intend to seek employment in the inland diving industry within the United States, these tickets will suffice as proof of your diving experience and qualifications, however, neither are recognized by the *international* diving community.

The majority of global oil companies and international diving contractors employ divers with International Marine Contractors Association (IMCA) and/or Health Safety Executive (HSE) certification for work done outside of the United States. IMCA, in general, only recognizes divers that have successfully completed commercial diving courses that comply with British Health Safety Executive (HSE), Canadian Standards Association (CSA), or the equivalent. Unfortunately, because the United States does not have standards that comply with international standards nor is there a U.S. Government organization to audit the standards (school house inspections), U.S. commercial and military trained divers do not qualify.

Okay…Now what? The big question is, how do you convert your military dive training and experience into qualifications that you can use to earn either an American Standard or an international certificate.

The Association of Diving Contractors International offers a Navy-Trained Divers Commercial Certification Card program (see April 2004 *Faceplate* article, page 8) that can provide many Navy-trained divers with ACDI certification.

The only method of obtaining an unrestricted international diving certificate is by successfully completing a commercial diving course by an accredited commercial diving school that provides international certification.

Presently, there are only three schools in North America (two in Canada and one in the United States) that offer this type of international recognition. Divers Institute of Technology – the only American school that offers international certification – is the only school in North America that can provide the international ticket as well as the U.S. certification (ACDE).

Each of these three outstanding schools provides an in-depth Prior Learning Assessment that is fully recognized by the Divers Certification Board of Canada (DCBC). Upon successful completion of the assessment process, the DCBC will issue the diver a certificate that complies with the Canadian Standards and is recognized by IMCA and HSE as an international diving certificate.

The assessment process is an evaluation that determines your military dive training and experience equivalency for credit to international competencies, and saves you time in the transition to your commercial diving career while eliminating repetitive training.

The assessment process uses a valid and reliable assessment of the knowledge and skills you learned through non-formal education, training or experience such as:

- Work experience
- On-the-job training
- Training courses from the Navy and private organizations
- Seminars and workshops
- Independent study
- Volunteer work
- Community activities

While many of the subject areas can be satisfied with your previous dive training and operational experiences, some competency areas may have to be either "tested out" or satisfied with the completion of a course of instruction for that particular area. In the event that the diver does not have sufficient deep dive experience, DIT also offers supplemental deep dive courses that will satisfy the international standards.

U.S. Navy Divers are among the best trained in the world. Before leaving the service, why not see if your hard-earned Navy training can help you establish a commercial diving career.

John Paul Johnson is a retired Navy Diver.

Truman Propeller Change

By: Scott Heineman

On 3 September 2004, Mid-Atlantic Regional Maintenance Center (MARMC) Dive Locker was tasked by NAVSEA propeller group (05H) to perform a Visual Technical Inspection (VTI) of USS HARRY S TRUMAN (CVN 75) starboard outboard (#1) and port outboard (#4) propellers. Several weeks earlier, Seaward Marine Services, Inc discovered a condition known as cavitation erosion during routine hull cleaning and inspection on #1 and #4 propellers. This data raised concerns within the maintenance community and required further inspection and evaluation.

VTI results were immediately sent electronically to COMNAVAIRLANT, NAVSEA 05H, and 00C. On 4 September, the recommendation was made to replace both propellers immediately. The situation was exacerbated by the fact that TRUMAN was scheduled to deploy the following month.

NAVAIRLANT requested 00C formulate a plan to replace both propellers and be completed by 30 September. 00C assembled a team comprised of MARMC divers, Phoenix International, Inc. (Phoenix) divers, and GPC/ESSM mechanics. Additionally, Southwest Regional Maintenance Center (SWRMC) Dive Locker provided their NAVSEA certified welding team to wet-weld rope guards.

Since both dive teams would be working the job concurrently on 12-hour shifts, two complete sets of aircraft carrier (CV) propeller equipment were assembled and sent by truck to Naval Station Norfolk from ESSM Williamsburg, VA and ESSM Port Hueneme, CA. All equipment arrived on 15 and 16 September and was loaded on a contractor barge and a U.S. Navy YC provided by Naval Station Norfolk Port Operations (Port OPS). MARMC and Phoenix divers spent two days assembling the jigsaw puzzle of equipment on their respective barges. Major components included the CV Ballast Tank, I-Beam, 50 metric ton hydraulic chain-hoists, boss and pilgrim nut handling fixtures as well as a myriad of wire ropes, shackles, tools, and the hydraulic power units to drive them.

#4 propeller.

Both barges were placed alongside TRUMAN by Port OPS tugs on 17 September and the crews went to work replacing the 61,500 lb propellers. The new propellers had arrived the day before and MARMC VTI's went to work performing the receipt inspection and making the propellers ready for installation. A-Frame assemblies that were placed on each barge were used to send and retrieve all equipment using air powered tugger winches. The winches used were 10,000 lb capacity with ¾ inch wire rope. The tuggers allowed divers to install equipment weighing as much as 3,500 lbs each. Needless to say, working smarter, not harder, was the order of the day.

MCPO Hunt briefing the team.

As with any job of this scope, Murphy was there on dive station and running amok. #4 boss nut would not come off. Phoenix divers had to rig the 50 metric ton chain hoist to take a pull on the boss nut wrench. It finally broke loose and moved one half inch with a pull of 31,000 lbs. Needless to say, this was way more than was expected. Keep in mind these propellers were original equipment, installed on the ship in 1994 and the propellers were manufactured/refurbished in 1993. That refurbishment in 1993 proved to be a game breaker.

Once both dunce caps and boss nuts were removed, divers discovered that each propeller only had two, 4½" withdrawal stud holes instead of the required eight, 3 ¼" holes. This meant that we could only pressurize the pilgrim nut to 8,100-psi vice the required 16,200-psi. How much of a difference is that? Well, 8,100-psi would provide 545 long tons of force. We needed 735 long tons to break the propellers off the taper. Not even close. Both dive teams applied the 8,100-psi force with no luck.

We even left one of the pilgrim nuts pressurized overnight; hoping a long “soak” would do the trick. Murphy wasn’t having any of it. Once we found that the propellers were not configured correctly, Mike Dean (00C5) dusted off the procedure for using explosives to help unseat the propeller. Keep in mind that this procedure is only authorized with 00C approval. The procedure is quite simple; getting authorization to use explosives underneath a nuclear powered aircraft carrier in port is a whole other ballgame.

Overhead shot of the SIMA Barge.

We assembled another team to accomplish this task. EODGRU 2 provided salvage demolition divers from MDSU 2 and explosive safety observers from EODMU 2. The detonating cord was obtained from TRUMAN’s Ordnance Handling Officer (OHO). An Explosive Event Waiver was generated by TRUMAN’s OHO with assistance from 00C, NAVSEA 08, AIRLANT, MDSU 2, Port OPS, and Naval Station Safety and sent to Commander Fleet Forces Command (CFFC) for approval.

Approval was granted and the procedure was underway. After both shafts were covered with 3 inches of manila line, MDSU 2 divers applied three concentric wraps of 42-grain/ft detonating cord, which was held in place by the leftover tallow from the dunce caps. #1 was pressurized to 8,100 psi and the electric shot was initiated. High order detonation was achieved, but the propeller didn’t budge. At the same time, 00C engineers were doing the math to figure out how high we could pressurize the pilgrim nut. The word was given to pressurize to 10,000 psi. Three minutes after we applied 10,000 psi, #1 was unseated. Soon after, #4 was pressurized to 10,000 psi and the primer cord detonated in the same fashion. #4 unseated as well.

CWO3 Zagursky blasting #1.

The procedure for rigging the propellers from the shaft, to the barge beam and then to the floating crane (YD) is a sight to see. Once the propeller is ready to be yard and stayed to the beam, the ballast tank is filled with water, approximately 50,000 lbs of water is pumped in to help maintain list of the barge. Once the transfer is complete, the barge is moved by tug to the YD. The YD takes the weight of the 50 metric ton chain hoist from the beam and away it goes. Once the propeller is out of the water, the propeller is rotated so the forward end of the hub is facing down so it can be placed on the pier.

Throughout this evolution, we had to keep our eyes on the many hurricanes brewing off the coast of Florida. Yes, we had to have a storm evasion plan, including moving the ship and our two barges to safe haven. One by-product of this weather was bad visibility, which was reduced to six inches. At 2400 on 29 September, the NAVSEA Project Manager and five Phoenix personnel had to assist Port OPS in moving the barge from its mooring outboard TRUMAN to safe haven three piers away. Pier 14 was experiencing three to five foot seas with 30-knot winds. The barge was returned to TRUMAN eight hours later. All in a day’s work, a 20-hour day that is.

Both teams were in automatic now, all the bugs had been worked out of the systems, and each diver knew his job. The weather was a nuisance at times, but didn’t keep us from progressing. By 4 October, the new propellers were on, the ship had four new rope guards welded on (#2 and #3 were deteriorated as well), and the teams were demobilizing from pier 14.

In all, both teams completed 177 accident free dives accounting for 343.9 hours of bottom time. TRUMAN sailed on time to play a major role in the Global War on Terrorism. This repair event proved once again that active Navy and NAVSEA contractor dive teams can work together seamlessly and provide the fleet with unmatched expertise and service.

Scott Heineman is currently the Underwater Ship Husbandry Operations Specialist.

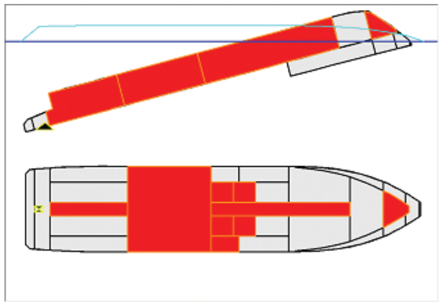
Salvaging M/V LEE III

By: CDR Brian Murphy

Five mariners onboard the offshore supply vessel Lee III died after their ship capsized following a collision with the container ship Zim Mexico III in the Mississippi River. The 178-foot, 183-ton Lee III, used to deliver people and supplies to offshore oil rigs, was heading to Port Fourchon, a major oil and gas port in south Louisiana, when it collided with the 534-foot long Container ship Zim Mexico III inbound for New Orleans. The incident took place at about 5:20 AM on February 21, 2004 in near zero visibility due to thick fog. The site was 50 miles south of New Orleans, Louisiana on the Southwest Pass of the Mississippi River. The Lee III turned over instantly and partly sank showing only its bow, and blocking the only entrance to the river for large oceangoing vessels.

Lee III in the middle of the Southwest Pass.

The Supervisor of Salvage was asked to assist USCG MSO New Orleans to ensure that the Heavy Lift and removal of MV LEE III, which was blocking the shipping channel into New Orleans, was conducted properly and with engineering analysis. NAVSEA 00C responded to the Mississippi River marine disaster by sending an engineering team of SUPSALV Engineers, Mr. Rick Thiel (Team Lead), CDR Brian Murphy, LCDR Nef Anastasio and LT Judd Southworth to model the vessel and analyze the varying conditions from its current capsized position through heavy lift. Expertise from MDSU 2 was



POSSE model of this condition.

added when CWO4 Rick Armstrong and MDV Mike Babin joined the team. NAVSEA 00C Engineers used the Program of Ship Salvage Engineering (POSSE) to model conditions and assess hull strength as a decision making aid to the Salvage Crew.

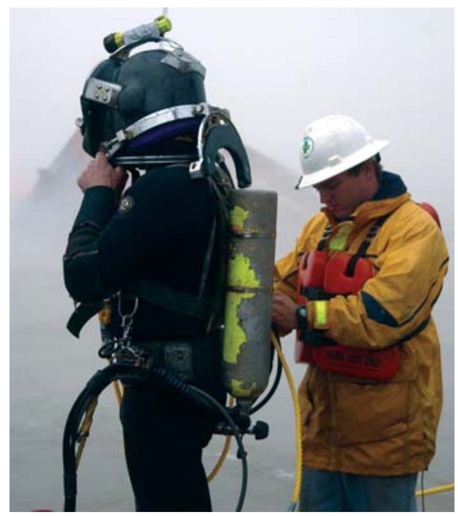
It was unusual to model the vessel completely upside down and with a ground point or "pinnacle" where the transom was touching the bottom. The damaged (red) areas were modeled based on reports from the divers and updated once the Lee III was pulled to the side of the channel and more detailed damage estimates could be made.

The first response was USCG search and rescue and environmental cleanup. No survivors were found, but environmental response workers recovered 630 gallons of diesel fuel using skimmers and absorbent boom. About 30,000 gallons of fuel were aboard the Lee III.

The sunken vessel's owner, Houston based Ocean Runner Inc., hired a salvage crew and divers from Bisso Marine to look for bodies aboard the partly submerged vessel and to remove the ship from the channel. Immediately, the BISSO MARINE salvage, logistical, and contractual teams constructed a salvage plan, coordinated logistics and worked out the contractual details of the operation. BISSO MARINE crews mobilized to the site where they used the 700-ton and 600 ton A-frames D/B CAPPY BISSO and D/B LILI BISSO as well as the 250-ton offshore derrick D/B BOAZ to salvage the vessel.

Two A-frame cranes lift the Lee III.

Divers recovered 3 of 5 crewmen from within the Lee III. A fourth crewmen was located downstream of the accident. Crews on scene encountered five-knot river currents, high winds, rain and fog as



Diver from Bisso Marine prepares to search the wreckage of the Lee III.

they prepared the Lee III to be moved from the middle of the channel.

U.S. Coast Guard hearings revealed that Zim Mexico III was traversing upriver at 11.5 knots. Lee III did not show up on the radar screen of Zim Mexico III until it was less than a mile away from the bigger ship. Both the master and the pilot aboard the Zim Mexico

III said that Lee III was quite near to an oil terminal on the eastern portion of the bank river. The proximity to the shore might indicate why the supply vessel did not show up on radar until it changed course and started heading toward Zim Mexico III. The master said the radar was set to pick up images 2.5 miles away. The two vessels established radio contact only 37 seconds before the collision. The bow lookout testified that he didn't see anything hit the ship. The first indication of the collision came when the ship shook from the impact.

Diver from Bisso Marine prepares to search the wreckage of the Lee III.

The salvage plan included a 4-point lift from the two A-frame cranes (700-ton and 600 ton) and landing the Lee III as-is, on an outfitted barge for removal from the area. The barge was set to receive the vessel upside down. A wooden cradle was built to account for the relatively weak deckhouse structure that would be bearing some of the weight to provide stability during transport. Once landed and lashed down, the Lee III was transported to Amelia, La., for accident analysis and then disposal.

The Force of the collision is evident to onlookers surveying the hull damage as MV LEE III is lifted.

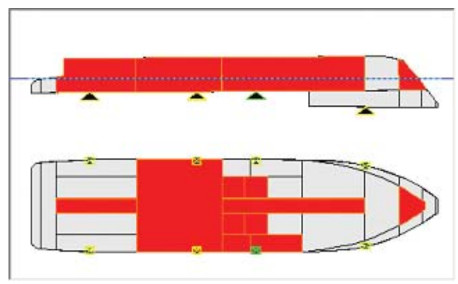
This lift was modeled in POSSE using 8 "pinnacles" as the lifting points to evaluate the midsection strength as a decision making aid to the salvage crew leader. The hull strength was sufficient for the lift provided that the cranes maintained even tension and lifted slowly enough for the water to drain out.

The lift was successful yet solemn. As the vessel was raised the details of the damage were revealed. Onlookers can only imagine what the force of the collision must have felt like when hit by a vessel with 100 times your momentum.

Gary LaGrange, Executive Director/CEO of the Port of New Orleans said the river closure impacted both cargo and cruise ship operations for vessels calling the Port of New Orleans and the entire Mississippi River system. The affected cargo includes consumer goods, raw materials used in manufacturing, petroleum products, and grain exports. "A closure, such as the one we have today, impacts the nation's economy. Sixty-two percent of America's commerce is shipped on the Mississippi River. This alternate route to the Gulf of Mexico must be maintained," said LaGrange. The MV Lee III incident cost approximately $3 million for each day that the local Port of New Orleans was disrupted. There were 51 vessels waiting to transit northbound and 52 waiting to transit southbound through the pass, according to the Coast Guard, primarily bulk and container ships. The majority of cruise ships affected by the closure have been able to arrange alternate port calls at Gulfport, Mississippi and Mobile, Alabama.

At one point, about 40 ships were backed up; including at least three large cruise ships carrying some 7,900 passengers. But the Grandeur of the Seas, with 2,600 passengers, was too big to leave its New Orleans dock by any other route. The Grandeur had been scheduled to leave Sunday. The delay was fine for passengers who wanted to see parades during the weekend leading up to Mardi Gras, but not for those who booked the cruise to escape Mardi Gras frenzy. The cruise ships were full because of the Mardi Gras celebration: "It couldn't have happened on a worse weekend," said Gary LaGrange, chief of the Port of New Orleans.

In conclusion, NAVSEA 00C provided technical analysis to support decision making by the BISSO Marine Salvage Team and to provide assurance of proper salvage oversight to the USCG Marine Safety Office New Orleans. All parties involved communicated in an open and professional atmosphere with BISSO Marine showing their expertise and professionalism by mobilizing to the site, recovering 3 crewmen and completing the salvage in 6 1/2 days, despite heavy fog, 48-degree water and 5 knot currents. Their success allowed one of the world's busiest waterways and the United States' main arteries for trade to return to normal operations.



POSSE model of the 8 lifting points.

CDR Brian Murphy is currently Submarine Program Manager and Atlantic Fleet Diving and Salvage Officer at Fleet Forces Command Maintentance Directorate, N43.

Command in the Spotlight

USS FRANK CABLE Divers Shine In USS SAN FRANCISCO Emergency Response

By: LT Will Hagan

One January evening during chow, USS SAN FRANCISCO (SSN 711) collided with a sea mount approximately 350 miles south of Guam. The initial report indicated a speed reduction on the order of flank to less than 4 knots in just a few seconds. By early Saturday morning, 8 January, the Naval Sea Systems Command had been notified and the command center manned. Shortly after, NAVSEA 00C was notified to assemble a diving contingent and coordinate diving assets in support of any possible combination of damage control and stabilization techniques. At this point the damage sustained was unclear; however, USS SAN FRANCISCO was under her own power and being escorted to Apra Harbor, Guam.

The Supervisor of Salvage and Diving, Underwater Ship Husbandry Director selected LT William Hagan and Mr. Tom McCue to act as on-site technical representatives. SUPSALV immediately commenced mobilizing equipment to support any possible combination of damage control and stabilization techniques. NAVSEA 00C engineers, Hagan and McCue, from Washington, D.C., and divers from Bayou Vista, Louisiana, immediately departed for their journey to the other side of the world. Equipment, including twelve lift bags, an assortment of rigging gear, and four 8’ x 10’ boxes containing the diving and welding systems were shipped from the Emergency Ship Salvage Materials (ESSM) bases in Pearl Harbor, Hawaii, and Cheatham Annex, VA.

Divers removing the sonar dome.

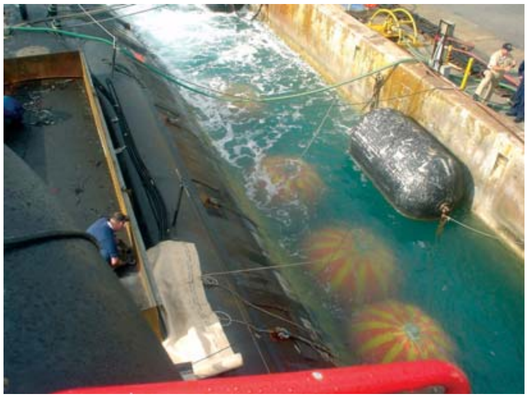
NAVSEA 00C on-site representatives provided coordination with the Naval Supervising Activity (NSA), which in this case was a Pearl Harbor Naval Shipyard response team lead by Captain Chuck Doty. Understandably, the NSA’s initial concerns were for safety of the reactor compartment, which was found to be completely intact with no apparent damage. After this determination, NAVSEA 00C was permitted to initiate diving operations with the two dive teams consisting of 00C contract and USS FRANK CABLE divers. NAVSEA contract divers supplied a well-trained team of fully qualified underwater welders led by Mr. Lance Shupe, while Master Diver Tom Stogdale lead a highly motivated and equally competent dive team from USS FRANK CABLE.

USS FRANK CABLE divers hard at work installing lift bags.

Wednesday morning, LT Hagan and EN2 Langley were the first divers to enter the water under close supervision from IT2 Stover and Tom McCue. Diving was authorized only after a majority of the ship’s potentially affected systems had been tagged out for precautionary measures to ensure diver safety due to the condition of the ship. The divers shared the underwater video camera, recording over 2.5 hours of video on the initial dive and recover a large piece of a porous coral rock lodged in one of the port side torpedo doors. Throughout the initial survey dives, USS FRANK CABLE divers were able to record more than 15 hours of video directly to DVD and take more than 50 still pictures.

The initial inspection revealed more damage than expected. The damaged area extended from the port side torpedo doors to the keel area of the most forward elliptical bulkhead; most of the sonar dome was missing. The sonar sphere, a critical concern within the submarine intelligence community, although unrecognizable, remained firmly attached to the ship, but shifted several feet to starboard. Divers also discovered the ship’s mooring lines protruding from the sonar sphere access trunk. Divers finally found a point of reference when they traced out the sonar dome mating ring, which led aft at a 70 degree angle and ended near the vertical bulkhead inside main ballast tank 1B. Upon further inspection, large holes giving visual access to main ballast tank 2B were identified as well as a small hole in the upper portion of 2A. At this point the NAVSEA 00C technical representatives began to consider options for underwater repairs.

Further inspection and many long hours studying video provided several possible solutions to the problems at hand, all of which were proposed to the NSA. The NSA decided to first address the ship's stability with the aid of diver resources and concurrence of NAVSEA 00C salvage engineers and Pearl Harbor naval architects. The second goal was to remove the weapons from the torpedo room including two weapons in the tubes. In conjunction with the first two goals, the divers were charged with restoring as much buoyancy as possible without adding weight and to remove obstructions hanging from the hull to make the ship as stable as possible for transit to the drydock.



Starboard side lift bags in place.

In order to gain buoyancy for the weapons off loading, NAVSEA 00C reps proposed a plan to install twelve 10-ton lift bags on the forward end of the boat to gain approximately two feet of freeboard. The first two lift bags were installed by attaching rigging to selected ballast tank flood grate openings. Rigging for the after bags was secured to the submarine's sail with wire slings and were rigged under the submarine to anchor the lift bag on the opposite side of the boat. Pearl Harbor naval architects and NAVSEA structural engineers advised USS FRANK CABLE hull technician on the placement of eight topside pad eyes in order to secure the rigging for the remaining eight lift bags.

Additionally, divers installed numerous flat patches to the hull with welded screw dogs. This method was employed on MBT 2A and 3B. Concurrently, divers prepared the interior surfaces of the hull and twenty-five gallons of underwater epoxy putty was applied to the more obscure hull forms where flat patches would not be effective. With twelve lift bags, most of MBT 2A restored, and approximately half of MBT 3B restored, the dive teams obtained three feet of freeboard and significant ship stability.

One of the largest operations the divers conducted was removal of the sonar dome. Through unequalled prowess with underwater hydraulics and sheer determination, USS FRANK CABLE divers were able to drill 4-inch diameter holes through 4 inches of sonar dome rubber and fiberglass in a matter of hours. Accompanied by the underwater cutting team, who cut away the connecting point between the submarine and the sonar dome, the damaged dome was removed and laid on the pier with the help of a floating crane.

On Saturday, 22 January, the carefully orchestrated off-load of all weapons from the torpedo room aboard USS SAN FRANCISCO became one of many completed milestones. Divers went back to work to remove the lift bags in preparation for transit to the drydock at Guam Shipyard.

USS FRANK CABLE Dive Locker posing on the dome.

Remains of the sonar dome.

Early Wednesday morning, USS SAN FRANCISCO left the pier under tug power and headed to Guam Shipyard's drydock, "Big Blue." A difficult docking experience ensued due to unexplained currents surging through the drydock. The docking team finally cradled the ship by the bow and gently set her down on the blocks. Navy divers quickly swam the blocks to ensure contact with all blocks while a local dive team inserted the two after most keel blocks. The dock was then raised to make the submarine "hard on the blocks" and divers again swam the blocks to pull block tags, ensuring for a second time that all blocks had solid contact.

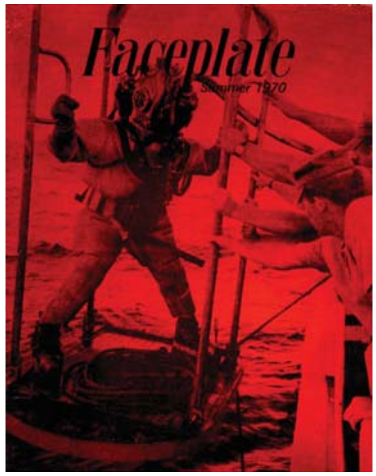
Overall, the three dive teams working as one cohesive unit, were responsible for removing eight damaged ballast tank flood grates, installing twelve lift bags, twenty-five gallons of underwater epoxy both on the inside and outside of the ballast tanks, eight patches welded to the hull, removal of the remaining portion of the sonar dome, and expertly laying the USS San Francisco to rest on the blocks in the drydock.

LT Will Hagan was until recently Underwater Ship Husbandry Project Engineer at NAVSEA OOC5.

35 Years Ago in Faceplate
Deepest Open Sea Dive

The deepest depth ever reached in the open sea by U.S. Navy men . . . . On 22 April 1970, M.T. Bell (DCC), D.C. Risk (BM1), F.L. Reanda (MR1), and L.K. Goacher (BMC) dove and worked at 650 feet for two hours, using the Mark I Deep Dive System. LCDR McDermott, PCO of ASR 21, was in charge; OPCON was under COMSERVGRU ONE, San Diego. Submarine/Diving Medical Personnel from EDU and SUBDEVGRU ONE were in attendance.

The dive was performed from the deck of the USNS GEAR (ARS 34), moored in the lee of Anacapa Island off Port Hueneme, California. The divers, working at 650 feet, had no difficulty whatsoever. They were kept warm by hot water supplied from the surface to open-



circuit hot water suits. Communications from divers to the Personnel Transfer Capsule (PTC) and to topside were excellent. The two working divers (one man tended from inside the PTC) wore newly developed life support equipment — one wore the Kirby-Morgan Band Mask; another wore the Mk 1 Mod 0 mixed-gas SCUBA. The divers were saturated at 60 feet before descending in the PTC. After the working dive, they were brought back up in the PTC and transferred into the Deck Decompression Chamber (DDC). At the time of this writing, they continue saturated in the DDC, under careful observation of medical personnel — awaiting more and possibly deeper dives.

A significant aspect of this dive is the total success of a deep working dive of this duration, but surface based and without the expense associated with bottom habitation.

4-4-4... OBITUARIES ...4-4-4

Robert (Bob) Kutzleb

Bob Kutzleb, a retired U.S. Navy Officer and a pioneer in the field of underwater search and recovery operations, recently passed away after a two year battle with cancer.

Bob began his Navy career as a seaman recruit at the onset of World War II, and spent the war years serving on submarines in the Pacific theater. Following the war, he remained with the submarine force, receiving his commission as a Limited Duty Officer and serving as Missile Officer. He attended the U.S. Navy School of Diving and Salvage in 1959, where he was certified as a Mixed-Gas Diving Officer. He served as Commanding Officer of two submarine rescue vessels, USS PENGUIN and USS KITTIWAKE, prior to his retirement as a Lieutenant Commander in 1964.

After a two-year stint as project coordinator for submarine construction at

Newport News Shipbuilding and Drydock Company, Bob joined Ocean Systems, Inc. as Operations Manager in 1966. Ocean Systems was the first of a series of firms contracted to provide commercial search and recovery expertise to the U.S. Navy's Office of the Supervisor of Salvage and Diving (SUPSALV).

For the next 20 years, Bob continued to support the SUPSALV office, personally directing over 200 search and recovery projects worldwide. These projects included a number of high visibility operations, including the search for KAL Flight 007, the search and recovery of the submersible Alvin, the search and recovery of the Space Shuttle Challenger, the search for an Air India 747, and the search and inspection of the ore carrier M/V EDMUND FITZGERALD in Lake Superior.

During this time, Bob co-founded Seaward, Inc. and founded Steadfast Marine, Inc., two well respected firms in the marine services industry.

The Pipe

By: Bev Morgan

I leaned against a bulkhead as our small boat set out of the harbor and went North along the coastline. A light wind from the West drifted in and ripples formed here and there on the smooth water. The morning sun was low on the cloudless horizon promising a warm day for our diving operation. Frank Donohue and Ramsey Parks were dressing into their wetsuits as Ramsey explained the job.

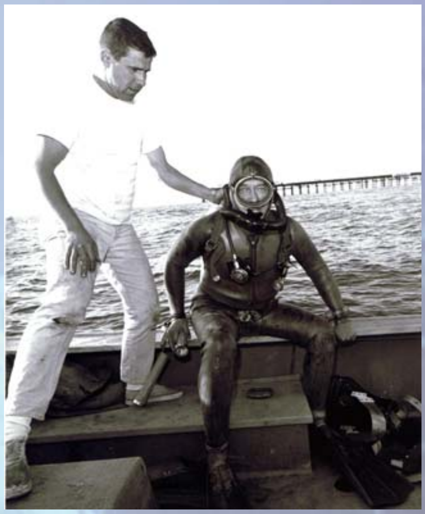
"The pipe is about 2,000 feet long by 10 feet in diameter. The engineers think that part of the pipe has sand in it and our job is to find out how much sand is in there."

I glanced at the breathing equipment they were going to use. Twin seventies with a single hose regulator and pressure gauge, and piggy-back, a single seventy with a one hose regulator mounted on it.

Ramsey continued, "There won't be any current in the pipe so we'll have to swim the full distance. Usually, they have a little current to help push the diver through the pipe but not on this job. When we start, we'll be heavy, so that at the end of the dive we'll be neutral when the air is used up from our bottles."

Each of the full seventies weighed about six pounds more when full so they were starting the dive with about 17 or 18 pounds more weight from the air in their bottles than at the end of their air supply. In a single seventy, this is not so noticeable, but it becomes an important factor when the diver is wearing 200 plus cubic feet.

"The pipe joints are 20 feet apart, so every five joints I will stop and fill one of my sample bottles with the sand there, and continue on. This will give the engineers a look at the type of sand that is in the pipe," said Ramsey.



Bob Meistrell tends Frank Donahue.

The boat slowed as the operator eased back on the throttle and we came alongside the buoy that marked the offshore end of the pipeline. The sight of the buoy brought back memories of other dives I had made in pipelines. I have never been completely comfortable in freeswimming gear in a pipeline. The specter of equipment malfunction, though remote, always seemed to hang over my head just prior to an inside pipeline swim, especially if it was alone, one like the one Ramsey and Frank were going to do. I knew what was on the other end of that buoy chain. The pipeline terminates its offshore run and abruptly turns up to an elevation of about 15 or 20 feet off the sandy bottom, ending with a roof-like structure having horizontal intakes around the pipe under the roof. I had always entered one of these structures cautiously and had always given a thought or two as to who was standing over the pump controls to make sure they were not turned on at the wrong time or in the wrong direction.

Frank Donahue.

I helped Ramsey and Frank into their triple bottle set-ups and handed Ramsey his bag of sample bottles. They sat on the gunnel a few moments, nodded to each other and rolled over backwards into the water with their heavy bottles. They kicked a few feet to the buoy and started down the chain. I watched as they rapidly disappeared from sight into the murky water. Visibility was six to eight feet, and with his excessive weight, Ramsey effortlessly drifted down the anchor chain. The pressure of the water compressed his suit causing an acceleration in his speed along the chain. He kicked his fins slightly causing his body to go horizontal and resist the downward acceleration slightly. He glanced over his shoulder to see Frank swimming down behind him. Frank looks light, he thought to himself, noticing Frank had to swim to stay with him on the descent. Well, it's not important, he thought, we're here and we'll get the job done. Ramsey noticed the change in angle on the chain and soon the lower end appeared in front of him. He waited for a moment, for Frank to catch up, then eased into one of the big intake holes. He flipped on his light and dropped to the bottom of the tower. Frank was there next to him and Ramsey noticed that his buoyancy seemed to be okay now. They glanced at each other's equipment, running their flashlights over the spare regulators, weight belts and harnesses. Everything was in order, so they started their long swim down the pipe toward the beach. Ramsey counted five joints in the pipeline indicating they had traveled about 100 feet. He stopped to inspect the bottom of the pipe which had about two feet of sand in it. He filled his sample bottle as Frank inspected the area. Then, they moved on. It was absolutely black now except for their hand lights. Ramsey looked behind him and could not see even the faintest trace of light coming from the tower. This is the moment when the cave diver and the pipeline swimmer realize they are truly on their own and this is the moment when the planning and the equipment must do the job. But there is no time to dwell on equipment and planning. It was important not to hesitate. They only had a certain amount of air, and they must do their job and make the end of the pipe with plenty of air in reserve.

The bag that Ramsey carried the sample bottles in actually had two compartments. The empties were all in one and as he filled them he would place the full bottle into the other compartment. He had twenty bottles and the sampling was every five joints of pipe or every 100 feet. He could reach down into his sample bag and count the bottles as he swam from one sampling station to the next. When all 20 were filled he would be at the end of the pipe. Actually, the job was boring with seemingly endless length of pipe, which was gray and drab, with a fine silty sand on the bottom. The only life to be seen was an occasional crab who would scurry along the sand to the pipe wall and disappear into the darkness along the edge of the sand. Ramsey counted ten full bottles in his sampling bag and realized they were about half-way through the pipe. He pulled his pressure gauge into view and read 1400 pounds. Good, he thought to himself. He started with 2400, was halfway through and had 1400 left. He was home free, or so he thought. On his way to the next sampling station, he noticed that Frank was getting extremely light and was swimming more than he should have been able to stay near the bottom for his inspections. Ramsey, being weighted heavy, was having an easy swim along the bottom, using his hands to walk with from station to station. He actually could pull himself along with his arms and travel very economically with this system.

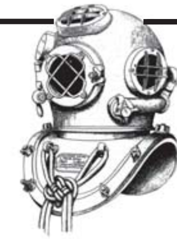
After the next sampling station, or perhaps the one after, he felt Frank hanging onto his piggy-back tank in an effort to stay near the bottom on the pipe. He swung around and looked at Frank and asked with his hands, if everything was okay. Yes, Frank nodded, go ahead, he indicated with his hands. As Ramsey swam on to the next inspection site, he kept being lifted off the bottom by Frank's excessive buoyancy. That, being combined with an increased swimming effort, made Ramsey a little bit more than slightly apprehensive. After a couple of more inspection sites, Frank's

Ramsey Parks.

hanging onto Ramsey with his buoyant condition became intolerable, and he decided to tell Frank to swim on along the top of the pipe and that he would finish the inspection along the bottom. About this time, Frank let go of Ramsey, and floated toward the top of the pipe. Ramsey turned around and saw that Frank had dropped his light and it was dangling by the wrist cord from his arm while he was busily fumbling about his neck and shoulders. Ramsey shined the light toward Frank and realized that he was very low on air from his main two bottles and was attempting to find the single hose regulator from his piggy-back bottle which had somehow come off the neck cord and was behind him. Ramsey quickly swam up and handed him his spare regulator which Frank promptly shoved into his mouth and took a couple of relief breaths. With all the excessive swimming with Frank holding on and now this latest commotion, Ramsey decided he had better check his own air pressure. His gauge was down to 500 psi but that at least put him 500 psi in two seventies, ahead of Frank at his point. He quickly looked at Frank, who had become organized, and indicated to Ramsey that he was through inspecting and was going to swim the remaining way along the pipeline since he was on his reserve air. Ramsey shook his head in agreement and set about to follow him.

Frank, being light, had turned upside down and was swimming and walking with his hands along the top of the pipe. Frank is a big man with long legs and he was making the most of it toward the end of the pipe. Ramsey was heavy and was following Frank along the bottom of the pipe. The water inside the pipe, since there was no motion from waves, was slightly improved in visibility and Ramsey could see Frank's light, perhaps twelve to fifteen feet away. Ramsey reached down and counted his full sampling bottles, he had 16. This meant they were closer than 400 feet to the end of the pipe and could make it quite easily on the air they had. Once out, they could get more air and come back in for the remaining four samples that were needed. Ramsey felt relieved and glad that their problems were no more serious than a scuffle to find Frank's reserve air regulator. Ramsey settled into keeping up with Frank and started counting the pipe joints that came up every 20 feet. He noticed he was breathing heavily to keep pace with Frank. He had counted 10 joints of pipe when his regulator started drawing hard. He didn't know if it was due to his increased breathing efforts or if he was out of air on his doubles. He tried to swim up and grab Frank's fins to have Frank help him with the change-over to his emergency regulator in the event that he could not find it. But there was no catching Frank. The extra effort to try to grab his fins only caused Ramsey to draw harder on the regulator and make it seem harder to get any air out of it. He decided to stop and make the change-over while he still had some air left in his doubles.

(To be continued in the next issue.)



Topside; Red Diver...

From the Supervisor of Diving

Captain Mark Helmkamp, USN

American Thunder – and more...

I noticed long ago that many Navy Deep-Sea Divers are at their core, gear-heads. Probably one of the worst cases of nitro-methane insanity is found in our own ENCM Vern Geyman who devastated all burnout competition challengers at the NDSTC sanctioned event a few years ago. His canary-yellow ’34 Ford three-window coupe, with exposed big-block blower motor “smoked the hides” from the flag pole directly in front of the school until alongside the salvage ground tackle display. A well-prepared small block Z-28 Camaro and a GTO – well actually, a LeMans conversion – were formidable, but lacked the huffer and were well short on torque by comparison. Many students, instructors and me (the CO at the time) were brought to tears of pure, unadulterated joy at the sight of that fearsome display of raw, uncorked horsepower.

But there’s more: Jerry Pelton, a.k.a. “Mr. Corvette”, has been known to shred asphalt back by the non-mag area in Panama City – but shhhh, don’t tell anyone. And Sandy Bacia still spends every weekend at the drag strip. Of course, there are divers at the other end of the spectrum, too, like road warrior BMC P.T. Moore’s van, a veritable mobile Super Fund site. And while Harley Davidsons can be found in any Navy Dive Locker parking lot, more and more young divers are opting for hot sport bikes and nitrous fed “tuner” cars instead of push-rod V8 motivated Detroit iron. Still, divers’ taste for quick metal remains constant; it’s just the recipe to satisfy that hunger that has changed. Enjoy our four-page spread on “Divers and Their Rides” on pages 12 through 15.

Next Generation Diving System Update

Navy Experimental Diving Unit (NEDU) continues to progress in its development of components for the Next Generation Dive System (NGDS) for surface-supplied air diving.

The Oxygen Regulating and Control Assembly (ORCA), a central component of the NGDS hardware, was successfully man-tested in Apra Harbor, Guam, on 7 – 17 October 2004, hosted by the Commander of Naval Forces Marianas (COMNAVMAR), and supported by the COMNAVMAR Dive Locker. (See Faceplate, February 2005, page 3).

Volunteer divers from six commands completed 84 dives to depths from 80 to 190 fsw and with bottom times from 11 to 49 min using MK 21 MOD 1 breathing rigs with air or oxygen supplied from a MK III lightweight dive system via the ORCA and 3/8-inch, 300–foot umbilical. To support these dives, NAVSEA provided the procedures and tables for decompressing divers in the water on

TDM with “ruggedized” components: Panasonic Toughbook computer, new pressure transducer, underwater electrical connector, and power cord in lid of container for connection to ship/shore power. If no power exists, there are two 12V batteries (lead acid) in bottom of container.

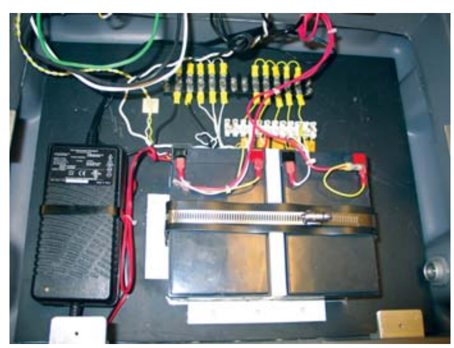
oxygen. These tables were calculated with the Thalmann VVal-18 Algorithm. The ORCA was easily able to support both the air and in-water oxygen requirements of up to three divers (two working and one standby divers) using these procedures with little discernable breathing resistance. Draft ORCA operating and emergency procedures were also exercised with divers providing valuable feedback for modification and simplification of several of the procedures, as well as of certain ORCA hardware features.

The ORCA was accompanied by a proof-of-concept version of the Topside Decompression Monitor (POC-TDM), which will eventually provide real-time decompression prescriptions for all supported divers based on the actual depth-time profiles experienced by the divers. Pressure sensor and communications failures prevented the POC-TDM from providing these prescriptions in the Guam dives, but divers were able to use the accompanying Thalmann Algorithm Windows Dive Planner to analyze dive data from the Dive Charts. The divers were readily able to gain appreciation for the advantages of real-time calculation of decompression obligations as they compared Planner and Table decompression prescriptions for given dives.

Overall, the VVal-18 tables prescribed a total of 896 minutes of decompression for the 84 man-dives completed in this series. When the actual dive depths and bottom times were entered into the Dive Planner, the Planner prescribed a total of 550 minutes of decompression, a 39% savings of 346 man-minutes.

In more recent work, the Planner has been modified to support U.S. Navy diving missions other than those using surface-supplied air, and forwarded to PMS-NSW for completion of the formal Verification, Validation, and Accreditation (VV&A) process required for approval for Navy use, and trial distribution to selected fleet users under NAVSEA waiver.

Development of a prototype TDM is on track for open-water testing late this calendar year. This updated TDM will sport a graphical user interface (GUI) that was presented in a preliminary form to a working committee of operational divers at the 2005 Working Divers Conference in Keyport, WA. Again, participants provided valuable feedback about the content and format of the information that they want displayed in this GUI; feedback that is being incorporated into the prototype. The prototype also addresses failure modes that were encountered in the Guam dives: A new pressure transducer and underwater electrical connector for each



Close-up of the transducer connection.

Topside; Red Diver... (continued)

supported diver are considerably more rugged than those that failed in these dives. Finally, channels have been opened with the Navy Safety Center to interface the TDM input requirements and recording capabilities with the pending internet-based Dive Reporting System to reduce current logging and paperwork requirements on the dive side. These are all vital first steps to the ultimate objective of safe and efficient tableless and paperless diving by computer in the U.S. Navy.

Marathon Man: Is it safe?

It has been over ten years now since a 36 year-old EOD officer died after a standard, no decompression requalification dive in Guam. The officer had arrived at the dive locker early in the morning of the dive after flying five hours from his duty station. He had only four hours sleep in the previous 30 hours. The dive team assembled, equipment was issued, and pre-dive checks completed. The Dive Supervisor conducted the mandatory brief. The Supervisor asked the officer if he was uneasy about diving to 120 feet after eight months without diving. The officer responded that he was ready to dive.

The dive team arrived at the dive site in the early afternoon and moored to a buoy marking a wreck. The officer and another diver dressed out and were inspected by the Supervisor. The divers entered the water and swam to the descent line, descended to the wreck, and then began their ascent after a four-minute bottom time. Both divers surfaced and reported “OK” and swam to the boat.

The officer had a little trouble getting into the boat and upon squaring himself away once aboard, the Supervisor asked him, “Are you OK?” The officer replied that he was OK and then promptly slipped to one knee. The Supervisor, sensing trouble, had the officer sit on the side of the boat and even while the officer still insisted that he was OK, his chin sank to his chest. His blank stare and apparent weakness confirmed to the Supervisor and the officer’s dive partner that the officer was *not* OK. The Supervisor’s immediate diagnosis was arterial gas embolism (AGE) and he had the officer lay on the deck and administered O_2. The Supervisor made preparations to get underway and while doing so, was unsuccessful in his attempts to raise the dive locker by radio to alert and make the recompression chamber team ready.

Within a few minutes the team had returned to the pier – and still had not been able to make radio contact with the dive locker. The Supervisor had a crew-member run ahead to notify the chamber crew and get transportation. Eighteen minutes after surfacing from the dive, the officer was sealed in the chamber and was being compressed to treatment depth.

Initially, the treatment went well. However, after about 30 minutes in the chamber, the inside tender reported the officer had tingling and decreased sensation in his lower extremities. After several hours, the tingling and decreased sensation worsened and the officer’s strength diminished. His pulse and respiration rates were dropping and medical authorities sensed the onset of cardiac arrest. After more than 49 hours in the chamber, the chamber crew brought the chamber to the surface. The officer had a rapid heart rate and no measurable blood pressure.

The officer was transported to a hospital by ambulance where his blood pressure stabilized. Upon reaching the hospital, his temperature was 106.9, pulse was 158, and BP was 98/25. He was immediately admitted into the Intensive Care Unit where further treatment was administered. His condition did not improve and ten days after the officer made this dive, he died. The diagnosis: arterial gas embolism with hypothermia and multiple organ failure.

Plan your dive, dive your plan. This was a routine Navy dive so what went wrong? Nobody knows for sure. The young officer was properly trained for the dive and was in excellent physical condition. A proper ascent rate of no more than 30 feet per minute was executed and the team arrived on the surface on time. What is known however is that the officer suffered an AGE.

Even as professional Navy Divers, with our extensive procedures, maintenance, and the high quality of our gear, diving remains a high-risk activity. Diving Supervisors daily live “Eternal vigilance is the price of safety” but even with the greatest attention to detail problems still occur. Think about other accident-causing factors beyond procedures and equipment and consider the personalities of your crew and then re-read LT Paul O’Connor’s article regarding non-technical causal factors (See Faceplate, February 2005, page 7).

Think about this tragedy and consider the following:

- Don’t dive without adequate rest
- Dive Supervisors must be acutely aware of their divers’ condition and experience
- Plan the dive and dive the plan, including a thorough check of all gear. In this case, a simple (final) radio check just before splashing the divers could have saved valuable time before pressing the diver for treatment.
- If divers come to your command TAD to requalification, verify that their dive physical is up-to-date and was completed by a DMO. Ensure their dive qualifications are current in accordance with MILPERSMAN 1220-260. “No ticket; no laundry.”
- Divers that have not made regular, recent dives should make shallow, work-up dives to reacquaint themselves with equipment and procedures. Review the U.S. Navy Diving Manual, Chapter 6-11.1.
- Conduct a periodic review of your command’s Diving Bill and standard and emergency procedures. Emergency drills *will quicken your team’s response* to a real life emergency.
- Finally, govern the “Hoo-Yah” – overly confident divers are a real menace to themselves and their dive partner.

The 2005 Salvage Executive Steering Committee meeting is scheduled for 26-27 of July, 2005 at the Washington Navy Yard. Please visit www.supsalv.org for more information.

“The Pipe”

A special “Thank You” to Bev Morgan who allowed me to re-print his 1967 short story *The Pipe*. You will all have to skip-breath until next issue to learn the fate of divers Frank Donahue and Ramsey Parks – sorry, get over it.