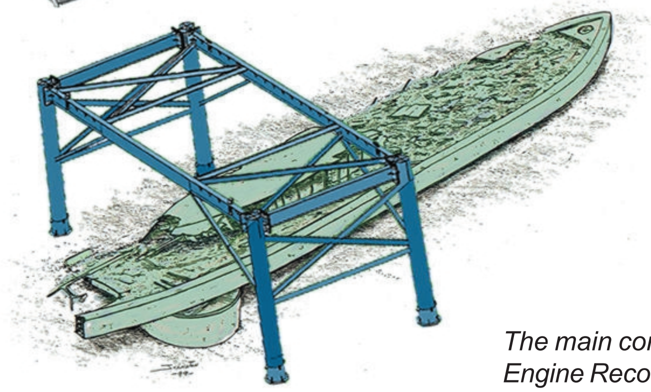
USS MONITOR
NAVY'S 1st Ironclad Warship (see page 8)

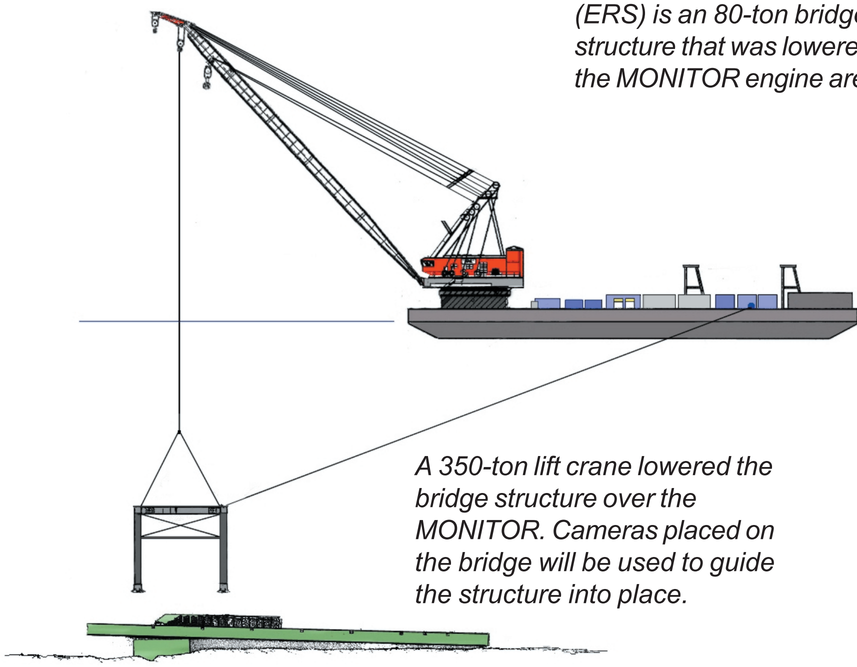
FACEPLATE

The Official Newsletter for the Divers and Salvors of the United States Navy
Volume 5, No. 2 / November 2000

Salvaging the USS MONITOR



The main compartment of the Engine Recovery System (ERS) is an 80-ton bridge structure that was lowered over the MONITOR engine area.



A 350-ton lift crane lowered the bridge structure over the MONITOR. Cameras placed on the bridge will be used to guide the structure into place.

SUPSALV Sends

Unfortunately, I am writing this while divers are working on two major Navy salvage operations. Both are prime examples of Navy divers supporting, not only our fellow sailors on the USS COLE and the USS LA MOURE COUNTY, but also again demonstrating extreme resolve in times of tragedy. As many of you know, Change of Command at Mobile Diving and Salvage Unit Two was postponed because of their extensive involvement in both of these operations. These operations and those addressed in this issue answer a question you may hear that is, "What have Navy divers done for me lately?" Well, simply point them to this FACEPLATE and remind them we serve 365/7/24 anywhere in the world. As exemplified by JFK Jr., EGYPT

(continued on page 2)

In This Issue

SUPSALV Sends *(continued from page 1)*

AIR Flight 990, ALASKA AIR Flight 216, GULF AIR flight 73, USS La MOURE COUNTY and USS COLE, Navy divers and salvors are there when called.

On a different note, I had the distinct honor of attending the Washington D.C. premiere of "Men of Honor", which was announced in our December 1999 issue. The film tells the story of a true Navy hero, MDV Carl Brashear. I urge you to go and see this inspiring film that depicts Carl's indomitable spirit, a spirit I have been privileged to witness on countless occasions as modern day divers answer their country's call. In addition the movie reminds us that neither skin color, race, creed, nor sex determine a diver's worth, it's what you do on the bottom that counts. Dive safe.

FACEPLATE is published by the Supervisor of Salvage and Diving to bring 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, 2531 Jefferson Davis Highway, Arlington, VA 22242-5160. (Attn: FACEPLATE). Visit our website at http://www.navsea.navy.mil/sea00c.

Over Our Heads in Hot Water!

By: CDR Erik Christensen, CO NEDU

Would you consider remaining completely submerged in a Jacuzzi for four hours while riding a stationary bicycle? That is exactly what we are doing at the Navy Experimental Diving Unit (NEDU) in Panama City, FL.

NEDU is the world's premier research and development, test and evaluation (RDT&E) facility for diving equipment and procedures. We test and evaluate diving, hyperbaric and other life support systems and procedures, and conduct research and development in biomedical and environmental physiology. Based upon this, we provide technical recommendations to NAVSEA in support of operational requirements to help keep America's Navy #1 in the world.

Supporting Navy divers in the Arabian Gulf is a primary area of our current focus. We are developing guidelines for SEAL, EOD and ship husbandry divers working in hot water (up to 99 deg F). To support this, our divers must ride stationary bikes underwater (to simulate swimming at a moderate pace) while breathing on a rebreather (to scrub out expired carbon dioxide and inject pure oxygen) for up to four hours or until body core temperature rises above 104 deg F. Divers are instrumented with portable EKG heart monitors and temperature probes while being continuously observed by our medical

Breathing a MK 18 Escape Breathing Apparatus (EBA) during a 2-hour saturation dive to develop emergency decompression schedules.

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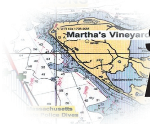

Search and Recovery of the Piper Saratoga Aircraft Piloted by John F. Kennedy Jr.

By: LCDR Jeff Stettler

Early in the morning of 17 July 1999, a private Piper Saratoga plane, piloted by John F. Kennedy Jr. and carrying his wife and sister-in-law, was reported missing enroute from New Jersey to the island of Martha's Vineyard, MA.

The National Search and Rescue Coordination Center initially supervised a massive air and surface search and rescue operation, subsequently turning it over to the U.S. Coast Guard District One Headquarters in Boston, MA. A Command Center, consisting of over 200 people from many federal, state, and local agencies, was established at Coast Guard Air Station Cape Cod. Several dozen national and international television crews and countless other media personnel flocked to the site of the Command Center.

NAVSEA 00C (SUPSALV) dispatched

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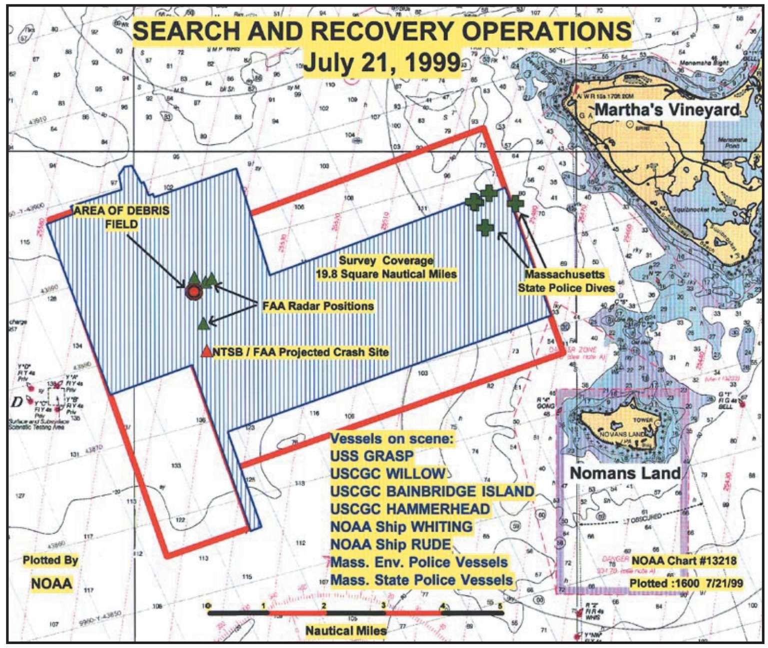

Search area and crash location.

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Preparing for an instrumented experimental dive in 99° F water.

staff. They typically will lose 5 to 10% of body weight during each of these strenuous dives. We recently provided the fleet with operational guidelines for diving in hot water while wearing swim trunks (AIG 239 - Diving Advisory 00-08) and are currently evaluating safe operational limits when diving in skin suits and dry suits (for contaminated water diving). One thing is for certain - this is much different than sitting in a Jacuzzi with a cool drink in your hand!

We recently developed accelerated decompression procedures for the evacuation of survivors from a disabled pressurized submarine. If the internal pressure of a sunken submarine rises due to flooding, rupture of compressed air lines or exhaust from EBAs, survivors cannot be brought directly to the surface due to the possibility of decompression sickness (the "bends"). This three-year study involved 24 trials of eight divers each in which we conducted experimental accelerated decompression procedures by breathing pure oxygen following a 72-hour shallow saturation dive. We were able to reduce the decompression time by 67%. The guidance that we developed will be used on future Submarine Rescue Diving and Recompression System (SRDRS) operations. When the Royal Navy recently mobilized to support the Russian submarine KURSK tragedy, they requested our accelerated decompression procedures in case any survivors were encountered.

There are billets at NEDU for all types of divers and at all paygrades. If you want a challenging and rewarding job, which offers the unique opportunity to personally participate in shaping the future of Navy and all DoD diving, this is the command for you.

CDR Erik Christensen is currently serving as the Commanding Officer of the NEDU in Panama City, Florida.

Alaska Airlines Flight 261

COCKPIT VOICE RECORDER AND FLIGHT DATA RECORDER "BLACK BOX" RECOVERY OPERATIONS

By: LCDR Jeff Beaty

On Monday, January 31, 2000, at approximately 1615, Alaska Airlines Flight 261 plunged into the Pacific Ocean less than 10 miles from the Southern California coastline. The jet was enroute to San Francisco from Puerto Vallarta with 88 people aboard when it fell into the ocean from an altitude of 17,000 feet. Immediately the U. S. Navy was called to assist in the search and rescue efforts. Among the first to get the call was Deep Submergence Unit, Unmanned Vehicles Detachment (UMV) located at the end of the runway at Naval Air Station North Island in San Diego. UMV Detachment operates two underwater Remotely Operated Vehicles (ROV) called SUPER SCORPIO. Each is equipped with high intensity lights and high resolution cameras, two Conan model manipulators with offset wrists able to do just about anything a human can do, and 50 hp hydraulic thrusters for propulsion, all of which are capable of working in depths up to 5,000 feet. Even though UMV's primary role is submarine rescue, their proximity to the crash site and expertise in underwater search and recovery made them the Navy's best asset for immediate response to the emergency.

PETTY OFFICERS Duncan (L) as Co-Pilot and Rodriguez (R) as ROV Pilot.

Deep Submergence Unit received official tasking the morning of February 1. The mission was to locate and recover the cockpit voice recorder and flight data recorder, often referred to as the "Black Boxes," for the National Transportation Safety Board's (NTSB) mishap investigation into what caused the MD-80 aircraft to suddenly fall from the sky.

UMV quickly loaded aboard their support ship, Research Vessel KELLIE CHOUEST, and got underway that afternoon to support the SAR efforts based

Flight Data Recorder.

out of Port Hueneme, California, only 9 miles from the crash site. Twelve hours later, the SCORPIO crew, led by CDR Kurt Sadorf, Officer in Tactical Command, and LCDR Jeff Beaty, Officer in Charge of DSU DET UMV, arrived at Port Hueneme to meet with SAR Coordinator, COMPHIBRON 3 and representatives from SUPSALV and the NTSB. Shortly thereafter, R/V KELLIE CHOUEST got underway for the crash site with members of the NTSB and Alaska Airlines onboard to assist

SCORPIO clutching the Flight Data Recorder.

in the recovery. Two photographers from Fleet Combat Camera Group San Diego, PH1 Spike McCall and PH1 John Juicehead, were onboard to provide documentation and media support.

EOD Mobile Unit 3 had previously completed side-scan operations and was able to provide two possible search locations called Areas of Uncertainty (AOU) on the ocean floor for the SCORPIO crew to begin the search. UMV arrived at the first AOU at 1400, Wednesday, February 2. The ROV launched at 1415 and sonar almost immediately detected a 37 kHz pinger that was attached to one of the boxes. MM2 Robert Rodriguez, the ROV pilot, began a 360-degree search and found the wreckage almost immediately at a depth of 635 feet. With guidance from STS1 Dennis Baker, the ROV Watch Supervisor, Petty Officer Rodriguez flew the ROV in the direction of the pinger. As the Co-Pilot, MM2 Robert Duncan scanned the ocean floor with his sonar, MM2 Rodriguez panned his pilot's camera in the ROV's path and a small orange rectangular box with white stripes came into view. Rodriguez set the ROV on the bottom and MM2 Duncan easily captured the box with the ROV manipulators. The box was quickly recovered onboard and identified as the cockpit voice recorder, which was transported to shore via small boat for

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From Certification 00C4

By: Paul McMurtrie

Based on Fleet input, we have made some recent additions and modifications to the 00C4 website. As requested by the Fleet Diving Community at the last Working Divers Conference, we have developed a downloadable standard Pre-Survey Outline Booklet (PSOB) for the Transportable Recompression Chamber System (TRCS). This standard PSOB has the majority of the information prefilled. The user needs only to go through the PSOB, adding their specific VCM numbers, any command specific information, and any information unique to their TRCS (additional gas supplies & calculations, chamber modifications, etc.). The TRCS standard PSOB should dramatically reduce the time and effort required to prepare a TRCS PSOB.

We have also, recently updated the PSOBs for Recompression Chambers and Surface Support Diving Systems. All commands should be using one of these new PSOB formats when preparing for a re-certification visit.

New on the 00C4 website, is the Standard Diver Re-Entry Control Procedures and Downloadable Re-Entry Control forms that are in a Word format. The Re-Entry Control qualification card is also available in a downloadable format.

Future additions to the 00C4 website will include the:

- System Safety Certification Manual
- Standard PSOB for the Light Weight Diving System (LWDS)
- Standard PSOB for the Fly Away Diving System (FADS III).

00C4 website point of contact is Mr. Paul McMurtrie (703) 607-1570 McMurtriepd@navsea.navy.mil.

BMCM/MDV(Ret) Paul McMurtrie is currently working in the Certification Division at 00C. Paul joined Cert after 22 years of active duty serving at various commands including Special Project, SPECWAR, USS EDENTON, NEDU, NRL, and NMRI.

(Continued from page 4)

analysis.

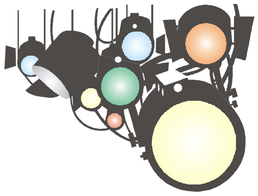
The SCORPIO crew soon launched the ROV to begin the search for the flight data recorder. Sonar eventually picked up a pinger but finding it proved more of a challenge than the previous search. As the second of two watch sections took over, ROV Watch Supervisor, STS1 Rick Wilmot led his watch team in a thorough search of the aircraft wreckage for the data recorder. The ROV Pilot at the helm for this search was ET2 Steve Tompkins with Co-Pilot STS2 Gabriel Marroquin. Unlike the first recovery, the pinger had separated from the box and caused the ROV crew to spend numerous hours searching the wrong area. After many hours of searching, the small cylinder shaped pinger was found…the box was not attached. “It’s like looking for a needle in the hay stack…except the hay stack is 635 feet under the sea,” said ICC Mike Subarich, SCORPIO Operations Division Officer. Petty Officer Wilmot’s watch team was not able to locate the box during their 6 hour watch but his team did a great deal to help create a detailed geographical plot of the debris field which later became an important part of the salvage operation.

SCORPIO being lowered into water from R/V KELLIE CHOUEST.

By noon on Thursday, February 3, less than 72 hours after Alaska Air Flight 261 fell into the ocean, the flight data recorder was located and recovered. R/V KELLIE CHOUEST and UMV returned to Port Hueneme for follow on tasking. A few days later, SUPSALV requested UMV get underway and conduct video surveys of numerous side-scan contacts along the flight path of Alaska Air Flight 261. Following analysis of both the voice and data recorders, it was determined that a piece of the aircraft may have broken away from the fuselage just prior to the crash. After several days of searching without locating any aircraft debris, UMV was released to return to San Diego in order to meet other commitments.

Salvage operations continued for several more months under the direction of SUPSALV. SUPSALV’s ROV DEEP DRONE operated by Oceaneering completed the bulk of the aircraft salvage.

LCDR Jeff Beaty currently serves as the Officer in Charge of the Unmanned Vehicles Detachment which is part of the Deep Submergence Group in San Diego, CA.

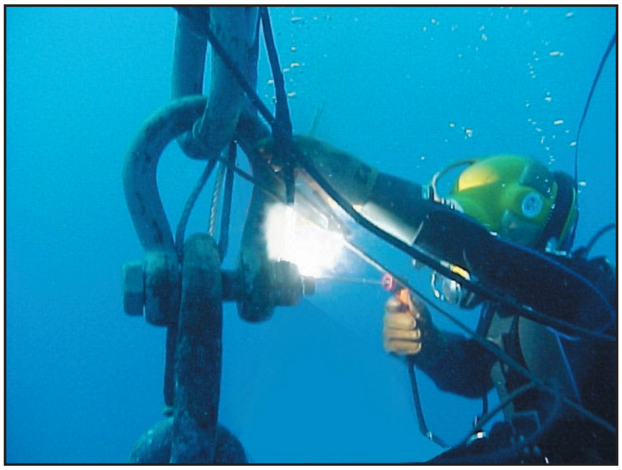


Command in the Spotlight

Mobile Diving and Salvage Unit Two
Detachment Roosevelt Roads, Puerto Rico

By: CWO3 Andy Nelson

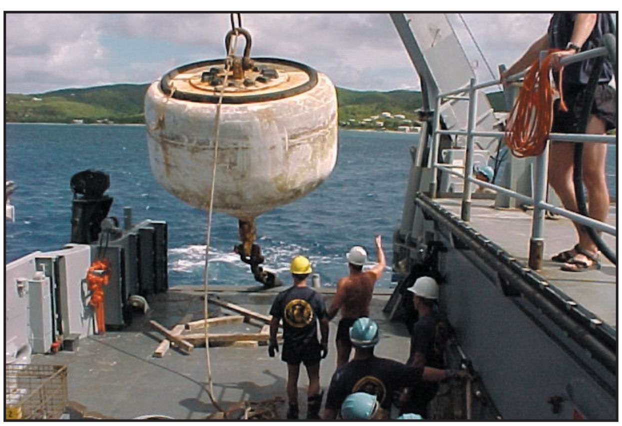
The sign at the front gate to Naval Station Roosevelt Roads, Puerto Rico reads, "Welcome to the Crossroads of the Caribbean". Mobile Diving and Salvage Unit TWO (MDSU 2) Detachment Roosevelt Roads stands on the shores of these crossroads ready to deploy its dive team throughout the Caribbean in support of diving operations at a moments notice. Established in October 1996, MDSU 2 Det RR is an integral part of the Naval Station's mission of training, readiness, and support to the fleet. Our mission is to provide primary diving and light salvage services to Naval Station Roosevelt and rapid response support throughout the Caribbean area of responsibility. We also have a modernized double lock steel chamber and provide recompression response for diving accidents (military and civilian) and clinical HBO treatments.



HT2(DV) Lombardo welds a shackle nut in place.

Known as the "Pirates of the Caribbean", our dive team takes on any challenge. You may find us replacing propellers on surface ships, anchors on submarines, responding to a hurricane disaster on a neighboring island, or conducting hyperbaric treatments on a local diver. If it involves diving or hyperbarics in the Caribbean, we will be there.

Recently we were called upon by Naval Facilities Engineering Command to reinstall one of their fleet mooring buoys located off the West Coast of St. Croix, U.S.V.I. Hurricane "Lenny" ripped the 4,000-pound buoy from its mooring and tossed it ashore like a beach ball. Our dive team recovered the lost riser chain, inspected and reattached it to the buoy, then reattached the buoy and riser chain to its three leg mooring arrangement. Rigging the connecting ring off the bottom at 110 FSW for reattachment to the buoy riser chain was a diver's dream! Chain hoists and lift bags were used to bring 8,000 pounds of mooring leg to the riser chain. Once connected the shackle nuts were welded in place to prevent backing off. "Mission Complete". Thanks to the support of Special Boat Unit's ASDV platform (a converted LCU) we were able to perform Sur "D" O2's using their onboard double lock aluminum recompression chamber.



4,000 lb. mooring buoy tossed ashore by Hurricane "Lenny".

In March 2000 we conducted a series of clinical Hyperbaric Oxygen (HBO) treatments on a Navy Sailor who had a large part of his ear amputated. The HBO treatments were designed to arrest the progression of infection and assist in the reattaching of the severed ear part. Treatment table nine was effectively utilized. Although the severed ear part could not be reattached, the healing process was enhanced and further infection was prevented. This treatment along with the many other clinical treatments being conducted by other Navy Hyperbaric Facilities are a positive indication that the Navy is growing with the times. Our dive team enjoys diversity of work, the best of weather (with the exception of an occasional hurricane), and the close-knit camaraderie of a smaller dive locker. Each day brings on a new challenge, and we look forward to each challenge!

I would like to thank the plank owners of Mobile Diving and Salvage Unit TWO Detachment Roosevelt Roads, especially CWO4 Clayton and Master Diver Myers for their hard work and foresight in establishing this command. I would also like to mention the names of this hard working Navy team that make each day successful: BMCS(SW/MDV) Robarts, HTC(SW/DV) Morin, ENC(SW/DV) McCaulley, EN1(DV) Brodeur, BM1(DV) Francis, HM2(DV) Roller, QM2(DV) Hay, BM2(DV) Alley, HT2(DV) Lombardo, LT(DMO) Altamar, LT(DMO) Rodriguez, and HT2 Edwards. Hoo-Yah, Deep Sea!!!

CWO3 Nelson served as Master Diver SIMA New York and SIMA Norfolk prior to commissioning as a Chief Warrant Officer. As a CWO he served as Diving Officer NSSF Groton, CT and is currently Officer in Charge MDSU 2 Det. RR.

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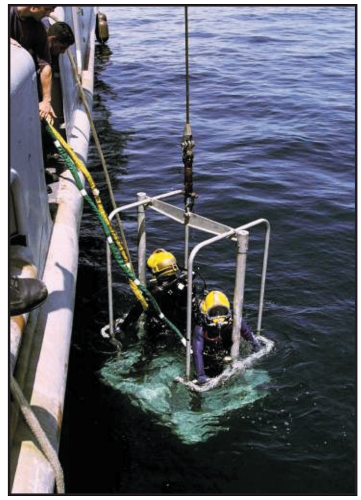
a Salvage Officer to Cape Cod along with a contractor side scan sonar expert to assist in the initial underwater search and recovery planning and to direct employment of SUPSALV search and recovery equipment. Commander Combat Logistics Squadron Two (COMLOGRON 2) dispatched his Salvage Officer to Cape Cod to coordinate efforts for employment of the salvage ship USS GRASP, which had been directed to get underway from Little Creek, VA to assist.

In addition to the Navy resources employed, the National Oceanographic and Atmospheric Administration (NOAA) volunteered two of their oceanographic survey ships equipped with side scan sonar. NOAA Ship RUDE was the first ship on the scene and was conducting side scan sonar operations by the afternoon of 18 July. NOAA Ship WHITING arrived on 19 July. The two NOAA ships, along with the SUPSALV side scan system SWISS employed aboard the Coast Guard Buoy Tender USCGC WILLOW, were searching for aircraft wreckage by the afternoon of 19 July.

First Dive pre-divers brief by MDV Stock aboard USS GRASP.

The search area was established based upon limited radar information provided to SUPSALV by the Federal Aviation Administration (FAA). Some uncertainties led to an expanded initial search area of 20 square miles, centered approximately 6 miles west of Martha's Vinyard. A high probability sonar contact was located on the evening of 19 July, in a water depth of 120 ft. Following the arrival of the USS GRASP, SUPSALV Remotely Operated Vehicle (ROV) MR-2 investigated the high probability contact. In the evening of 20 July, the ROV visually identified the aircraft wreckage and identified one victim lying adjacent to the wreckage.



First set of divers enter the water from USS GRASP.

In the morning of 21 July, additional investigation by the ROV and divers from the GRASP confirmed the presence of two additional victims lying underneath the main section of fuselage. Divers from the GRASP recovered all three of the victims in one dive. In the afternoon of 21 July, the main section of aircraft, consisting of engine, cockpit and fuselage, was recovered to the deck of the GRASP in a second dive. The remainder of the scattered wreckage was recovered by the divers on multiple dives on 22 July. On 23 July, the GRASP moored at Naval Station Newport, RI, and turned over the wreckage to the National Transportation Safety Board (NTSB).

The overall search and recovery operation was a straightforward one. It consisted of two days of search followed by two days of recovery. Due to the intense public, media, and political interest which surrounds the Kennedy family, briefings and press releases were issued by only the Commander, Coast Guard District One and the Chairman of the NTSB. Since it became apparent that cellular telephone conversations were being monitored by the media, it was necessary to use secure hand-held VHF radios of limited range. The different agencies involved lacked a common mode of secure communication which, in a more complicated operation, could have significantly affected the successful completion.

LCDR Jeff Stettler is Assistant for Salvage for NAVSEA 00C.

MONITOR 2000

By: CAPT(sel) Phil Beierl
and LT Paul Ware

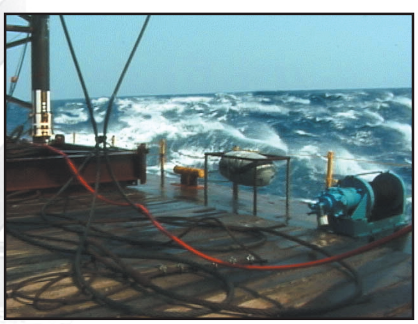
Gunport and bow pictures provided by NOAA

Tomorrow our precious time will run out and we will have to recover our anchors and leave. We have been moored 240 feet above the USS Monitor off Cape Hatteras for a month and are anxious to get home—but not with this huge hunk of steel still on deck. The most ambitious part of our mission is the installation of the massive 90-ton Engine Recovery Structure (ERS) and despite our best efforts we're not finished yet.

The ERS has three components that work as a system. The 70-foot by 30-foot Bridge Frame stands 35 feet high and spans the Monitor to provide the support to lift the historic steam engine without crushing the wreck. Sitting atop and perpendicular to the Bridge Frame will be a 40-foot long movable frame called the Trolley that will hold hydraulic rams to raise and lower the third component, the Engine Lifting Frame (ELF). The ultimate plan is to connect the steam engine to the ELF and use hydraulics to lift it out of the wreck, after which the entire ERS with the engine will be lifted to the surface—but that is next year's mission.

Two weeks ago we were blessed with a calm day that permitted us to lower the giant Bridge Frame to the bottom and precisely position it straddling the historic wreck. But the smaller Trolley with the Engine Lifting Frame suspended underneath is proving more stubborn. Twice in the past few days we have attempted the cumbersome lift and twice the crane's huge main blocks (each weighing 15 tons) have swung crazily or become hopelessly fouled in the heavy wire rigging—forcing us to abort. Now with the wind and the seas dying down we have one last chance.

Divers from MDSU 2 coming up and over the side of the Crane Barge.



A rough day on the platform, common of the treacherous waters off Cape Hatteras, NC or otherwise known as the "Graveyard of the Atlantic".

The boom of the 350-ton crane points skyward with the main hook two hundred feet above us as the heavy wires of the bridle take a strain. Gauging the movement of the barge perfectly the expert crane operator plucks the 20-ton load off the deck and swings it safely away from the barge. Third time is the charm we think and collectively breathe a sigh of relief as the Trolley traverses all the way around the barge and is pulled gently alongside the lee of the barge. Several divers scurry out onto the Trolley and install the cameras that will guide the assembly into position on the bottom. Earlier in the day we had repositioned the barge so the crane could reach the right spot over the wreck, and now we swing the load out to the beam and begin to lower away.

The action shifts inside to the television monitors as the two hundred-foot descent begins and before long the bright white targets we had painted on the Bridge Frame loom into view on the screens. "Heave in ten feet on anchors #6 and #7 and pay out on #2 and #3…Boom down two feet…Down six feet on the load." Darkness falls as a long string of such orders slowly guides the Trolley into position until it finally lands on the Bridge Frame. At last the entire ERS is in place, centered over the Monitor's engine room. We have achieved our main objective and laid the foundation for future recovery efforts. We have overcome wind, wave and current in the Graveyard of the Atlantic and now we can afford to relax a little and look

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back at how it all started…

Serious planning for Monitor Expedition 2000 began in February with an extensive effort spearheaded by Mobile Diving and Salvage Unit TWO (MDSU 2) in partnership with the National Oceanographic and Atmospheric Administration (NOAA), NAVSEA Supervisor of Salvage and Diving (SUPSALV), and Oceaneering International Incorporated (OII). The first objective in the plan was stabilization of the wreck by placing grout filled bags under the armor belt, which was unsupported except where it rested on the famous gun turret. The second objective was to make good progress toward recovering the unique steam engine. The Department of Defense Legacy Foundation had agreed to provide $2 million to the project to enhance realistic diving and salvage training for Navy divers, but the money was not made available until just two months before the expedition was set to begin. In this time a suitable vessel had to be hired and outfitted, the ERS had to be manufactured, a host of special tools and equipment needed to be procured, and a team of over one hundred personnel organized and trained.

All this was somehow accomplished and on 17 June the Weeks 526 derrick barge arrived in Little Creek and mobilization began in earnest. For six days all hands worked long hours converting the 289-foot by 80-foot barge into a small floating city with portable berthing, galley and laundry modules, generators and power distribution systems, sewage and potable water systems all installed on deck. The Flyaway Mixed Gas Diving System, a portable diving davit and a vast quantity of mixed gas in portable racks took up still more space. The grout mixing system with its huge tanks for storing dry cement was installed just forward of the dive side. Portable winches, air compressors and hydraulic power units were tucked in every conceivable location. Finally the 350-ton derrick lifted the ERS from the parking lot where it had been assembled and set it down on the only empty spot left on deck.

Spirits were high despite the nearly midnight hour as the Tug Katherine pulled the barge away from the pier and out to sea. Unfortunately it took a week of battling weather and a return to port to re-rig the anchors for easier deployment before we finally found ourselves on site with the eight mooring anchors set and the barge positioned over the Monitor. With no navigation equipment on the barge, the anchors were set and the barge positioned using handheld GPS pluggers. It wasn't fancy but it worked as our first test dive with camera mounted on the stage revealed the turret of the Monitor just 50 feet away. Over the course of the next two weeks of diving we carefully recorded the position of the barge and the stage on the bottom each day until we had determined very accurately the GPS position and heading of the wreck. This data proved crucial in the precise installation of the ERS.

Crane getting ready to drop the bridge and ERS (Engine Recovery System).

The currents and constant swell common off Cape Hatteras pose unique challenges to deep surface supplied diving and particular techniques have evolved over the course of this and previous Monitor expeditions. The current acting on the umbilical can pull a diver off the stage or make it impossible to pull down slack to go to work once on the bottom. To counteract this problem we married spinnaker shackles into the divers umbilicals, with one a few feet from the diver (the "short shackle"), another at 75 feet (the "long shackle") and then every 50 feet. On descent the divers carried the first 75 feet of working umbilical coiled up in front of them with the "long shackle" secured to the stage and taking the strain of the current. The remainder of the umbilical was shackled into the stage wire to keep the catenary to a minimum. On the bottom the divers could work virtually unaffected by current and wasted no time getting to work. On ascent the divers connected the "short shackle," tripped out the long shackle and the tenders took up the slack. We had no line pull signals but with voice communications and helmet mounted cameras we felt comfortable. The stage was kept under control by using a very large clump (1000 pounds) on a wire descent line. The clump was kept well off the bottom and was mounted on a swivel to keep rotation (caused by the current) from unlaying and parting the wire. We were able to dive effectively in currents up to two and a half knots with these procedures. Even with these methods it sometimes took four tenders to handle each hose and stronger currents sometimes prevented diving operations entirely.

The divers first task was to place highly visible targets on the wreck that would be used to guide the ERS into position at the first opportunity when the seas were calm enough. With this quickly accomplished, the work of stabilizing the Monitor began. One at a time, the wedge shaped bags were carried to the bottom, rolled up like pup tents, and then unrolled and tied across an aluminum frame. Inserted under the wreck and staked to the bottom the frame would hold the bag in position until we were ready to begin pumping grout. The eight custom designed bags ranged from 5x8 feet to 8x16 feet in size so it took several days to get them all in place.

Filling the bags with grout was an even slower process. Each bag had sand pumped through a hose tethered to a second identical descent wire and clump (the "grout" clump) forward of the dive side. The divers had to insert the nozzle into a fill tube to begin filling a bag, and then remove the nozzle and flush the hose when

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EgyptAir990

By: Tom Salmon

On 31 October 1999 EgyptAir Flight 990 crashed off the coast of New England. The USCG immediately launched a SAR mission involving numerous air and surface units to attempt to locate any possible survivors. Concurrently, CINCLANTFLT and the Joint Staff, as well as NAVSEA SUPSALV, commenced planning to mobilize USS GRAPPLE (ARS 53), USNS MOHAWK (T-ATF 170) and NAVSEA search and recovery systems to assist in the search effort sure to come.

At the request of NTSB, SUPSALV (SEA 00C) dispatched LCDR Jeff Stettler, 00C2O to the site to initiate development of a search plan to locate the Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR). At the same time, 00C's Undersea Operations contractor, Oceaneering Intl., was directed to prepare to deploy the SWISS side scan sonar and Towed Pinger Locator systems, as well as the Remotely Operated Vehicles (ROV) DEEP DRONE and MR-2.

The initial information provided by the SAR units and FAA radar indicated that the plane crashed approximately 55 miles South of Nantucket Island in 40 fathoms of water. To expedite the search LCDR Stettler arranged for a USCG C-130 to transport a search technician and handheld pinger locator from Andrews AFB to Otis AFB, where the initial SAR effort was being coordinated. The following morning, a USCG helo flew the technician out to a Coast Guard cutter on-scene to commence the search. Working out of a rigid hull inflatable, he very quickly detected a 37.5 kHz source, which is the frequency used on the FDR and CVR. Upon further investigation, he was able to determine that there were actually two pingers very close to each other, exactly where LCDR Stettler and the search planners had estimated they would be.

With the location of the beacons known, defining the search area was relatively simple. Based on the radar data and location of floating debris, a six mile square grid was laid out for MOHAWK with SWISS, and NOAA Ship WHITING with her side scan sonar to search. Upon arrival at the site, MOHAWK confirmed the location of the pingers with the towed pinger locator, and then launched SWISS. Both MOHAWK and WHITING located what appeared to be an aircraft debris field on their initial passes over the pinger location. As the search expanded away from the pinger location, it became apparent that the debris was in a very concentrated area not much larger than a football field.

Wreckage from EgyptAir Flight 990 aboard SSV CAROLYN CHOEST.

Deteriorating weather forced both MOHAWK and WHITING to return to Newport, RI, where the SAR and Salvage Command Post was established. GRAPPLE arrived Newport on 2 November and immediately commenced loadout of SUPSALV's ROV DEEP DRONE and the Mobile Diving and Salvage Unit TWO (MDSU 2) Flyaway Mixed Gas Diving system.

On 5 November, CTU 20.9.9 stood up as the OTC for the salvage effort and USS AUSTIN (LPD 4) arrived Newport to support the offshore effort, providing logistics, berthing, boat transfer and helo support. GRAPPLE, MOHAWK and WHITING departed for the search area to complete the search and commence the salvage effort. Because of the poor weather conditions encountered at the site and the water depth, use of the MDSU 2 divers was only considered as a last resort. Safety remained the highest priority throughout the operation.

On 7 November, the SUPSALV MAGNUM ROV system was mobilized. MAGNUM was installed on SSV CAROLYN CHOUEST, the submarine NR-1 support ship based in New London, CT. This provided two salvage systems to work the debris field, increasing probability of locating and recovering the recorders before the batteries died on the pingers.

Poor weather continued to plague the salvors, but ultimately, on 9 November, GRAPPLE reported that DEEP DRONE had successfully recovered the FDR. NTSB and FBI agents immediately took possession of the recorder and CTU 20.9.9 arranged for helo transport from AUSTIN directly to Andrews AFB, for further transfer to the NTSB lab for analysis. That accomplished, the effort resumed to locate and recover the CVR.

Between MAGNUM and DEEP DRONE, the competition was fierce. Ultimately, on 13 November the race was over.

(Continued on page 11)

(EgyptAir continued from page 10)

Once again, DEEP DRONE, operated from GRAPPLE, won the battle. The CVR was located, recovered and turned over to the accident investigators. Ironically, the pingers, which are about the size of a flashlight battery, had detached from both recorders, and were never found. In both cases, the DEEP DRONE just happened to spot the recorders while searching the debris for the pingers. This explained why the ROVs had so much difficulty locating the recorders.

Next the task turned to salvage of the aircraft wreckage. NTSB and FBI investigators analyzed the information provided by the recorders and determined that they needed more of the aircraft to support their investigation. The salvage problem was compounded by the amount of debris involved, and the extremely poor weather conditions found during the winter in the North Atlantic. Because of the hazardous conditions, it was determined that there would be no possibility to use the MDSU 2 divers, and it was concluded that use of ROVs would not be cost effective. Instead, NAVSEA 00C developed a plan for bulk recovery of the debris utilizing a large offshore construction ship equipped with a large crane and clamshell.

On 18 November, all fleet assets detached from the operation and CTU 20.9.9 turned the salvage effort over to NAVSEA 00C. 00C directed Oceaneering Intl. to charter a support ship capable of quickly recovering the bulk of the aircraft debris. Oceaneering selected the SMIT PIONEER, a dynamically positioned, 514 - foot ship equipped with a 150-ton crane and 24,000 square feet of clear deck space. The plan was to outfit SMIT PIONEER with open-topped containers that would hold the debris. The crane would pick debris from the sea floor, deposit it in a bin on the stern where FBI agents would hose it off to remove as much sand/mud as possible. The debris would then be moved by front end loader to sorting bins, where agents would sort the debris and ultimately load it into the containers. A total of 34 FBI agents and 3 NTSB investigators would perform the sorting evolution.

SMIT PIONEER arrived on 7 December, having fought extremely rough weather crossing the Atlantic. Loadout of the salvage equipment was completed on 9 December, and the operation resumed when weather abated on the 12th. In spite of some equipment problems, the salvage effort went extremely well. Working around the clock from 13 December through 20 December fourteen containers were filled with debris. At that point, NTSB directed the ship to return to port for offload and evaluation of the recovered debris. When weighed during offload, it was detrmined that approximately 67% of the airplane had been recovered.

To determine whether to resume the operation with SMIT PIONEER, the Navy's submarine NR-1 was deployed to visually inspect the debris field. NR-1 completed the survey in less than 24 hours and provided extensive sonar, video and photographic coverage of the area. This showed that the remaining debris was very scattered and the bulk recovery technique for any additional recovery would not be effective. Accordingly, on 27 December, Chairman Hall of the NTSB directed NAVSEA 00C to demobilize SMIT PIOINEER and standby for further tasking, should a requirement for additional recovery be identified.

On 18 February 2000, NTSB Chairman Hall directed SUPSALV to return to the site and salvage an engine and other components that the Safety Board needed to complete the investigation. On 18 March, SUPSALV remobilized the ROV MAGNUM onboard SSV CAROLYN CHOUEST. Under the direction of LCDR Stettler, the Oceaneering crew resumed the salvage effort. Between 29 March and 2 April, between two severe winter storms, the salvage team successfully recovered one intact engine, part of the other engine, and numerous other items that the investigators needed. On 2 April, the NTSB advised LCDR Stettler that all desired debris had been successfully recovered and directed him to terminate the operation.

Tom Salmon, while on active duty served as a Salvage and Diving Officer in WESTPAC. Tom has been in the Office of the Supervisor of Salvage since 1975 and Head of the Operations Division for the past 13 years.

NAVAL FORCES UNDER THE SEA: PAST, PRESENT AND FUTURE

27-29 March 2001, Alumni Hall, United States Naval Academy, Annapolis, MD 21402

A symposium, co-sponsored by the Office of Naval Research and the U.S. Naval Academy will be held in Annapolis, Maryland during March 27-29, 2001 to address and highlight the U.S. Navy's significant developments in science and technology related to diving, Special Warfare and submarine rescue, and look at the Navy's plans for the future. A primary objective of this symposium, open to the general public, is to capture and preserve the historical base of knowledge in this discipline that in many cases resides only in the minds of the primary contributors in this area. The 3-day symposium will address one of three primary topics each day in historical order of occurrence. The primary activity for each day will be a series of presentations and panel discussions on the topic of the day. Secondary activities will include live demonstrations, static displays, oral histories and group interviews. For further information about the symposium activities check out the website: http://www.usna.edu/NAOE/symposium.

MIXED GAS DECOMPRESSION TABLE REVISED

(USS MONITOR 2000 EXPEDITION SERVED AS OPEVAL)

By: Dr. Ed Flynn

Our surface-supplied mixed gas decompression tables are by far the oldest decompression tables in the Diving Manual. The Momson tables relied heavily on the use of 100% oxygen during decompression to clear body tissues of helium. In those early days of diving, relatively little was known about the toxic effects of oxygen and the tables called for oxygen breathing in water as deep as 60 feet. Experience soon showed that this was excessive, and revisions in 1950 reduced the depth of oxygen breathing in the water from 60 to 50 fsw. The 50 foot oxygen shift persisted throughout ensuing decades, but not without incident. Every year, one or two cases of toxicity were reported.

With the introduction of the FlyAway Mixed Gas Diving System in 1997, the Navy experienced a resurgence in helium-oxygen diving which had become dormant in the early 90's following the decommissioning of the deep diving ships. From 1995 to 1999, a total of 405 helium-oxygen dives were conducted, many of which were operational dives deeper than 200 fsw. With this increase in diving activity came an unexpected surge in oxygen toxicity cases. Five of these cases ended in convulsions.

In June 1999, a panel of medical experts was convened at the Naval Submarine Medical Research Laboratory in Groton CT to review these cases. The panel could find no clear cause for the increased incidence of oxygen toxicity. It concluded that 6 cases in 400 dives were clearly excessive and that the tables needed to be revised to eliminate oxygen breathing in the water. SUPDIVE tasked NEDU to revise the tables.

The principal problem faced by NEDU was how to reduce the oxygen partial pressure during decompression without simultaneously increasing the decompression time or the risk of decompression sickness. Working in conjunction with Duke University, NEDU used two probabilistic models, one model describing the risk of decompression sickness and one model describing the risk of CNS oxygen toxicity, to explore the various tradeoffs. The models predicted that if the diver began a 50% oxygen, 50% helium mixture at 90 fsw and continued to breathe this mixture until eligible for surface decompression, the risk of oxygen toxicity could be greatly without substantially increasing the decompression time.

The engine recovery operation on the USS Monitor provided the perfect opportunity to test these new procedures. Divers from Mobile Diving and Salvage Unit TWO, augmented by active duty and reserve divers from several CONUS commands, dove the new tables under extremely arduous conditions. More than 150 dives were performed at an average depth of 230 fsw. Bottom times ranged up to 40 minutes. There were two cases of decompression sickness which was considered well within acceptable limits given the conditions under which the dives were conducted. More importantly, there were no signs or symptoms of CNS oxygen toxicity in the water.

Following the Monitor Expedition, Mobile Diving and Salvage Unit ONE had the opportunity to dive the new tables in preparation for Operation Pacific Reach. Twenty-six dives were made to depths between 100 and 300 fsw without decompression sickness or oxygen toxicity in the water.

The data from all these dives is now under review at NEDU and a new Chapter 14 with the revised dive tables has been prepared. These new procedures will appear in the next revision of the Diving Manual.

Dr. Ed Flynn, Captain USN (Ret) is a undersea medical officer currently working at NEDU. While on active duty Ed served as Senior Medical Officer at the Naval School Diving and Salvage, Director of Diving Medicine at NMRI and C.O. at Naval Medical Research Development Center.

PMS Corner

"Service to the Fleet"

Planned Maintenance is now available for the following equipment. Any commands having custody of these Buoyancy Compensators may download from CD-ROM Force Revision 2-00. Commands should follow-up with submission of a Feedback report requesting the addition of Buoyancy Compensator(BC) Maintenance Index Page(MIP) to Work Center(W/C) List of Effective Pages(LOEP).

- Buoyancy Compensator Zeagle Ranger 5921/002
- Buoyancy Compensator IDI Advantage 5921/011
- Buoyancy Compensator ScubaPro Seahawk 5921/023

Cleaning and Sanitizing Diving Gear

By: Daryl Stanga

Concern over the transmission of disease or illness among persons sharing diving equipment has been a sensitive issue for military, commercial and recreational divers since the early 1970's. Many different groups have addressed this problem on many levels over the years. With the rise of many new organisms in the past few years this has again become a priority issue. The Military has used Wescodyne (Iodine based cleaning and sanitizing solution) and water as a cleaning and sanitizing agent for over 15 years. This solution has worked with satisfactory results, but there have been several complaints about Wescodyne from the operating forces. Most often citing confusion and difficulty with mixing the concentrate and that the iodine solution caused many of the rubber components of the dive gear to become gummy and breakdown. The rubber break down was most often caused by the solution being far too strong.

Navy Experimental Diving Unit has received information from diving commands on the West Coast. These reports identified several concerns regarding the use of Wescodyne cleaning solution. The most pressing problem for units of the Pacific Fleet is the lapse of Wescodyne's California Environmental Protection Agency registration in 1998. In response to this situation NEDU is identifying replacement sanitizing agents and cleaning procedures for use on U.S. Navy diving equipment.

A search of the market and contact with several manufacturers of cleaning, disinfecting, and sanitizing solutions; respiratory therapy departments, both in and outside the Navy; DAN; and other groups has resulted in the identification and recommendation the four following agents

1. SaniZide Plus
2. Advance TB_E
3. Bi-Arrest 2
4. Confidence Plus

SaniZide Plus

SaniZide Plus is a germicidal solution that is effective against a broad range of bacteria, viruses, and many fungi. The solution is provided in several sizes ranging from 1-gallon bottles to 16 oz. trigger sprayers. SaniZide is delivered ready for use and requires no mixing. The quaternary ammonium compound is non-corrosive and will not damage lens, plastics, rubber, or metal surfaces.

Manufactured by Safetec (telephone number 1-800-456-7077), the cost is approximately $1.60 per 2 oz. spray bottle or $6.00 per 32 oz. spray bottle. Safetec is a GSA contract company.

30 second contact time kills:
- HIV
- Influenza A2/HK
- Herpes simplex II

3 minute contact time kills:
- Polio I virus
- Rhinovirus

5 minute contact time kills:
- Staphylococcus aureus
- Salmonella choleraesuis
- Pseudomonas Aeruginosa
- Klebsiella Pneumoniae
- Candida Albicans

10 minute contact time kills:
- Mycobacterium Bovis BCG (Tuberculosis)

Advance TB_E

Advance TB_E is a germicidal compound, containing the same quaternary ammonium compound found in SaniZide Plus. The solution has the same disinfective characteristics and requires the same contact time. The Advance TB_E is provided ready to use in 16-oz. spray bottle or 1 gallon bottles.

Manufactured by Infection Control Technology (telephone number 1-800-551-0735), the cost is approximately $7.00 per 16 oz. bottle or $12.00 per gallon.

Specific germicidal activity:
- HIV-1
- Hepatitis A, B
- Escherichia coli
- Herpes Simplex
- Influenza
- Mycobacterium tuberculosis
- Pseudomonas aeruginosa
- Salmonella choleraesuis
- Staphylococcus aureus
- Trichophyton mentagrophytes
- Aspergillus niger

Bi-Arrest 2

Bi-Arrest 2 is a non-alkaline germicidal cleaner that offers a broad spectrum of effectiveness against many bacteria, viruses, and fungi. Its germicidal activity is not diminished by hard water and is non-corrosive. The solution is provided in a 4oz. concentrate bottle with a pump attached. Mixing directions are: Mix 2 pumps of the concentrate in a 16-oz spray bottle of water. Spray bottle is provided with the concentrate.

Manufactured by Infection Control Technology, (telephone number 1-800-551-0735), the cost is approximately $3.00 per gallon.

Specific germicidal activity:
10 minute contact time
- Mycobacterium tuberculosis
- Pseudomonas aeruginosa
- Staphylococcus aureus
- Herpes simplex
- Salmonella choleraesuis
- Streptococcus hemolyticus
- Diplococcus pneumoniae
- Salmonella typhosa
- Escherichia coli
- Proteus vulgaris
- Trichophyton interdigitale
- Aspergillus
- Influenza

Confidence Plus

Confidence Plus is a germicidal solution that is effective against a broad range of bacteria, viruses, and many fungi. The active chemical compounds are closely related to those found in Advance TB_E, and SaniZide Plus. It requires the same contact time, and has similar disinfecting actions. The solution is provided in a 32-oz. bottle of concentrate with a graduated measuring cup built into the top of the container. Mixing directions are 1 oz. per gallon of water.

Manufactured by Mine Safety Appli-

(Continued on page 14)

(Continued from page 13)

ances Company (MSA), (telephone number 1-800-672-2222), the cost is $12.97 per 32-oz. bottle of concentrate. MSA is a GSA contract company.

Specific germicidal activity:
10 minute contact time

- Salmonella choleraesuis
- Staphylococcus aureus
- Streptococcus pyogenes
- Escherichia coli
- Enterobacter aerogenes
- Shigella sonnei
- Candida albicans
- HIV-1

A review of the literature and discussion with experts in the field determined these agents possessed greater sanitizing abilities and were much easier to use in field conditions. The agents were used to clean and sanitize various pieces of diving gear following the manufacturer's directions and recommendations. The equipment was then placed in a small pressure vessel and pressurized to 100 psig. (225 feet of seawater), heated to 100 degrees Fahrenheit and held for 4 hours. A sample of the gas was drawn off and analyzed by the Navy Underwater Equipment Lab using gas chromatograph and mass spectrometry. The samples were analyzed and found to be safe for hyperbaric use. A recommended procedure for sanitizing diving equipment with these agents has been developed as an interim procedure until changes can be made in the Navy Dive Manual, PMS system, and Maintenance manuals.

Cleaning procedures:

1. SCUBA regulators

- With scrub brush and a non-ionic detergent solution, remove any gross contamination from the regulator.
- Rinse thoroughly with fresh water.
- Spray a liberal coat of solution on and into the mouthpiece and all second stage parts until all surfaces are wet.
- Let stand for 10 minutes. If solution appears to be drying, apply more solution to keep it wet for the full 10 minutes.
- After 10 minutes, rinse the entire second stage in a container of clean fresh water, or rinse under running potable water.

2. BIBS masks

- Remove BIBS mask from hose.
- Spray a liberal coat of solution to all surfaces including straps.
- Let stand for 10 minutes. If the solution appears to be drying, apply more solution to keep it wet for the full 10 minutes.
- After 10 minutes, rinse the entire mask in a container of clean fresh water, or rinse under running potable water.
- Allow to air dry before placing back in the chamber.

3. MK 20

- With scrub brush and a non-ionic detergent solution, remove any gross contamination from the mask.
- Rinse thoroughly with fresh water.
- Spray entire oral-nasal mask interior and nose-clearing device with solution until all surfaces are wet.
- Let stand for 10 minutes. If the solution appears to be drying, apply more solution to keep it wet for the full 10 minutes.
- After 10 minutes, rinse the entire mask in a container of clean fresh water, or rinse under running potable water.

4. MK 21

- With scrub brush, and a non-ionic detergent solution, remove any gross contamination from the mask and helmet.
- Rinse thoroughly with fresh water.
- Remove nose-clearing device and oral-nasal mask from helmet.
- Spray entire oral-nasal mask and nose-clearing device with solution until all surfaces are wet.
- Let stand for 10 minutes. If the solution appears to be drying, apply more solution to keep it wet for the full 10 minutes.
- After 10 minutes, rinse the entire mask in a container of clean fresh water, or rinse under running potable water.
- Reinstall mask and nose-clearing device in helmet.

5. MK 16 breathing hose and mouthpiece

- With scrub brush, and a non-ionic detergent solution, remove any gross contamination from breathing hose assembly.
- Rinse thoroughly with fresh water.
- Remove hoses from backpack.
- Rinse with fresh water.
- Spray a liberal coat of solution on and into the mouthpiece and into hoses.
- Let stand for 10 minutes. If solution appears to be drying, apply more solution to keep it wet for the full 10 minutes.
- After 10 minutes, rinse the entire assembly in a container of clean fresh water, or rinse under running potable water.

Note: For MK 24 facemask, follow procedures for MK 21.

6. Chamber oxygen hood

- Spray entire inside surface of hood and neck dam with solution.
- Let stand for 10 minutes. If the solution appears to be drying, apply more solution to keep it wet for the full 10 minutes.
- After 10 minutes, rinse the entire hood in a container of clean fresh water, or rinse under running potable water.
- Allow to air dry before placing back in the chamber.

7. Recompression chamber interior.

- Clean interior surfaces of chamber with non-ionic detergent solution to remove any gross contamination.
- Rinse with fresh water.
- Spray solution directly on chamber bulkheads, deck-plates or benches, or pour solution onto a lint-free cloth and use it to wipe down surfaces. **Do not apply to bedding.**
- Allow standing for 10 minutes, then wiping down with fresh water.

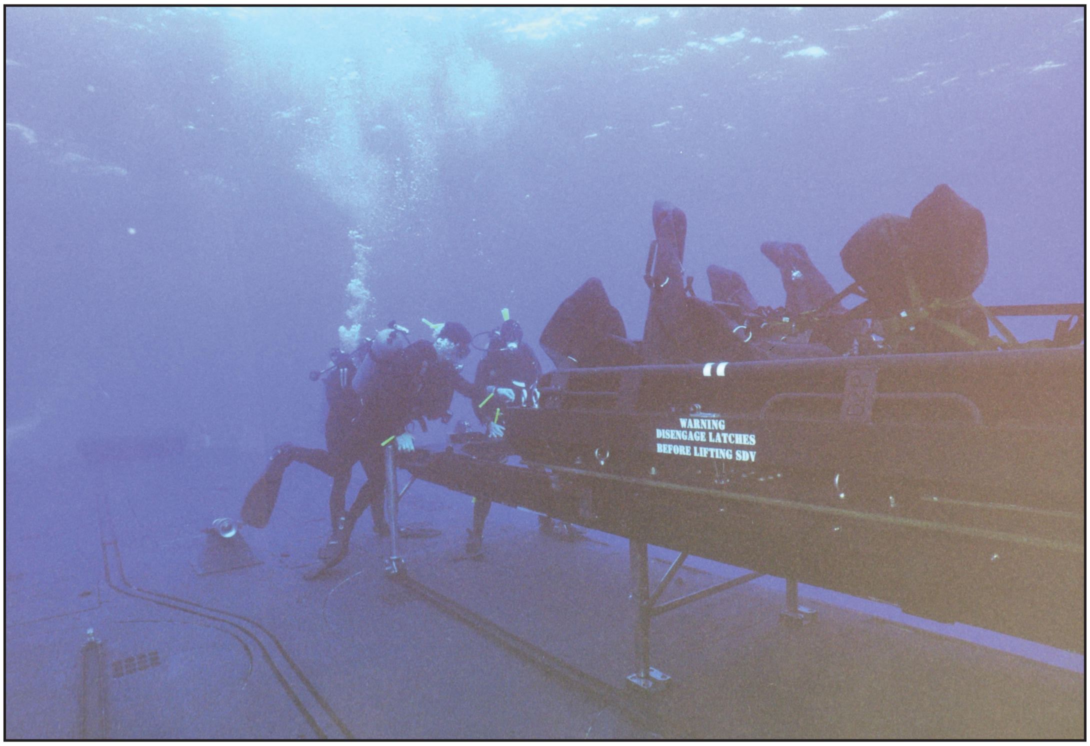
NEDU will continue to query the market and the groups mentioned above to insure these agents and procedures are the most current, effective and safe agents available.

HM1 / SCW / IDC / DV Daryl F. Stanga is currently stationed at Navy Experimental Diving Unit Medical Department, evaluating new medical equipment and procedures for use in hyperbaric chamber.

FROM THE WARRANT

SEAL Delivery Vehicle Team ONE (SDVT-1): Dry Dock Shelter Operations

By: CW02 F.A. Strynar



Seal Delivery Vehicle on Transport Cradle.

It is hotter than hell, you're jocked up in full rubber, crouched in the hangar waiting for the hangar flood valve of Dry Deck Shelter (DDS) 02P to open and cool you off with that nice 49 degree water. You're off the coast of a foreign country, the hangar is crowded with U.S. Navy Divers, U.S. Navy SEALS, foreign counterparts, rubber boats and equipment. Tonight's mission is classified SECRET, however it will call for the launch of Combat Rubber Raiding Craft (CRRC) and the rapid deployment of a combined force for a full mission profile (FMP).

You're a proud member of SDVT-1's Diving Department, DDS Element I or Element II. SDVT-1 is a key Naval Special Warfare (NSW) unit, the only one of its kind on the West Coast, located in beautiful Pearl Harbor Hawaii.

The DDS is fastened to either a SSN 640 or SSN 688 class host submarine and is comprised of three spheres. The forward sphere is the re-compression chamber, the middle sphere is the transfer trunk and the after sphere is the hangar. Both the transfer trunk and the hangar are flooded with seawater and compressed using divers air. The divers are responsible for all maintenance, PMS, and REC (it's all scope of certification QA).

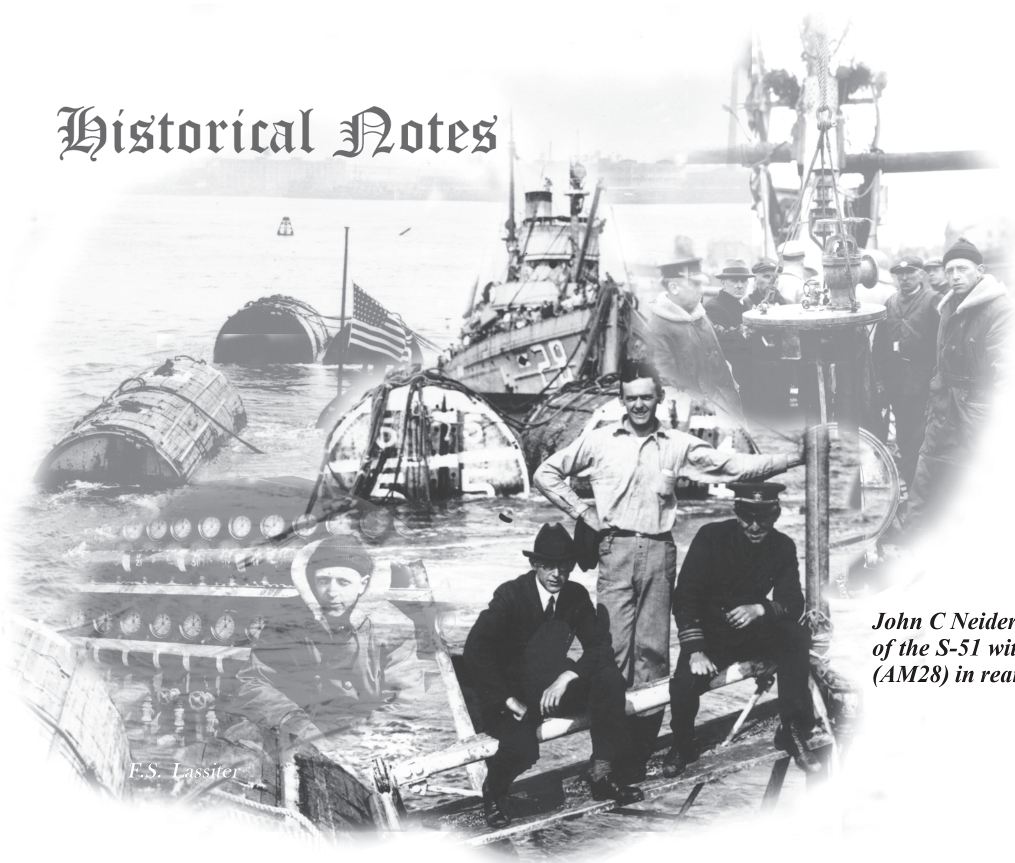
Divers man the following stations in the DDS and out on deck:

- Chamber Operator
- Trunk Operator – floods, drains, and compresses the trunk
- Hangar Operator – floods, drains, and compresses the hangar and passes orders from the Diving Supervisor
- Deck Captain – responsible for launch and recovery of CRRCs, SDVs, and all rigging
- Deck Crewman – works directly for the Deck Captain
- Hangar Supervisor – ensures that all wet operations run smoothly and that safety precautions are followed

In the host ship, divers man the following stations:

- Air Station Operator – ensures that air is continually flowing to the DDS
- Standby Diver – ready to lock into the DDS, if needed
- Tender – records the position of valve line ups and charts all dives using STD Air, No "D", CSMD, or the Navy Dive Planner
- DMO – uses the Navy Dive Planner and tracks de-compression obligation
- DMT – works on deck or in the chamber
- Diving Supervisor – runs the whole dive, manages the sphere, divers working on deck, SEALs de-compression (MK 16 or MK 25), and proper valve line ups
- Shelter Officer – interfaces with the ship and the SEALs and backs up the Diving Supervisor

(Continued on page 20)



John C Neidermair and the salvage of the S-51 with the USS FALCON (AM28) in rear.

John C. Niedermair and the Salvage of S-51 and S-4

By: Capt. Richards T. Miller, USN (RET)

On the night of 25 September 1925, the submarine S-51 was hit by the Ocean Steamship Company's CITY OF ROME 14 miles east of Block Island, NY and sank in 132 feet of water. Of the six officers and thirty-one men aboard only three survived. The entire boat was flooded. Initial salvage efforts by Merritt-Chapman and Scott and Navy divers failed and further attempts were abandoned. When the Navy subsequently determined to salvage the submarine, although Merritt-Chapman was the Navy's salvage contractor it had no expertise in submarine salvage, so the task was assigned to the Third Naval District, Rear Admiral Charles P. Plunkett, Commandant.

John Niederman, 1918 graduate of the Webb Institute of Naval Architecture, was employed in the scientific section of the district's Brooklyn Navy Yard. He was working on a study of the intact and damaged stability of merchant ships for a Stability Committee that had been established to develop standards for U.S. merchant ships. The Brooklyn yard became the base for salvage operations, and John was detailed to the position of on-site technical advisor to the salvage officer, Lieutenant Commander (later Rear Admiral) Edward Ellsburg. Captain (later Fleet Admiral) Ernest J. King, Commanding Officer of the Submarine Base at New London, was officer-in-charge. John departed the Brooklyn yard on 19 October with LCDR Ellsburg aboard VESTAL, which was to serve as a supply vessel and mother ship to the diving ship FALCON, four tugs and S-51's sister ship S-50 on-site.

Work had commenced on 15 October and continued until 7 December when winter weather and water temperature forced the salvage operation to be stopped. During that time, John helped develop successful techniques for controlled sinkage of the 60-ton and 80-ton lift capacity pontoons used, and made buoyancy calculations for compartments that could be sealed off and de-watered. During the period back in the Brooklyn yard in the winter of 1925-1926 the salvage plan was refined, salvage tools such as the underwater cutting tool and lights were improved and a nonreactive nozzle for tunneling was developed. John was back on-site with the salvage crew when operations were resumed in April 1926. The first attempt to raise S-51 was made 22 June 1926, but deteriorating weather caused a loss of control of the pontoons, so they

(Continued on page 22)

(Monitor continued from page 9)

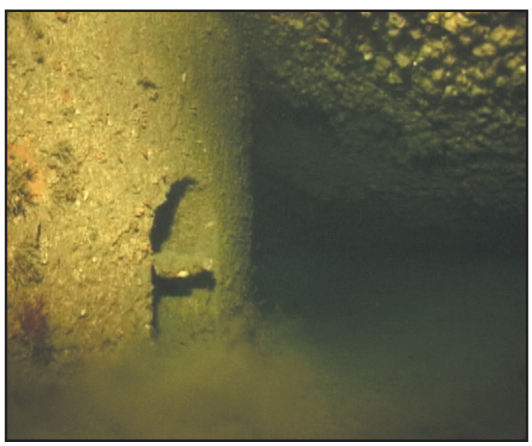
View of Monitors' bow, courtesy of NOAA.

finished to prevent the grout from setting up in the hose. With many layers requiring more than 30 minutes to fill there just wasn't enough bottom time available. By using the National Geographic mini ROV (tethered to the "grout" clump) to monitor the initial fill operation, pumping could begin without divers in the water and they could descend just in time to remove the nozzle, flush the hose and reinsert in the next layer. This process was repeated dozens of times in the ensuing days, sometimes using a pan and tilt camera planted on the bottom in place of the out of commission ROV. It took two full weeks, broken by a few days of 10-12 foot seas and a calm spell that allowed us to shift to installing the Bridge Frame, before we could call the stabilization phase complete and focus our attention on the engine recovery.

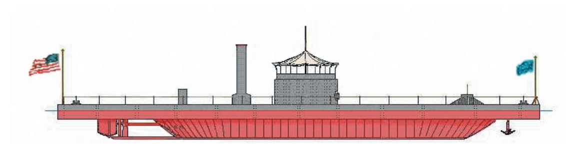
In between efforts to complete the ERS installation the divers severed the remaining ten feet of wrought iron propeller shaft using the same type hydraulic "guillotine" saw that was used in 1998 when the propeller was recovered. The shaft and supporting frame were then lifted to the surface, opening access to the rear of the engine room and freeing the engine from a large off center weight. Generally the NOAA archeologists responsible for the Monitor were meticulous in requiring that we exercise great care in working on or near the wreck so it came as a shock when we were permitted to go to work with hydraulic chipping hammers and grinders in an attempt to remove some engine room hull plating. Divers gleefully pounded and poked and pulled until a small plate reluctantly broke loose. The exercise was important in that it proved the hull plating in many places was in good condition and may not have to be removed when the engine is ultimately recovered. On the final dive of the operation the 28-foot long skeg that supported the Monitor's propeller and rudder was hauled from the deep and hoisted aboard—a fitting end to the expedition.

Over one hundred people rotated in and out of the team on the Weeks 526 barge during the course of this operation, including 76 Navy divers from MDSU 2, SUPSALV, USS GRAPPLE, EODTEU TWO and Combat Camera Atlantic. Fifteen percent of those divers were Naval Reservists from MDSU 2 NR Detachments 101, 507 and 413 who jumped in without missing a beat. The effort at sea was supported by an indispensable logistics effort including an advance base at Coast Guard Station Hatteras Inlet. Fundamental to the success of the operation was the unprecedented four-way partnership between NOAA, SUPSALV, OII and MDSU 2, which proved up to the task of executing this complex and risky project on a tight budget and schedule.

One hundred and sixty deep mixed gas dives and countless days of heavy rigging after we began, we arrived safely home—proud of our achievement yet humbled by the privilege of working on the historic wreck of our Navy's first ironclad warship.



View of the Gunport, courtesy of NOAA.



USS Monitor December 1862

CAPT (sel) Phil Beierl is the Commanding Officer of Mobile Diving and Salvage Unit TWO and was the On-Scene Commander for the MONITOR 2000 expedition.

LT Paul Ware is the Diving Medical Officer and Public Affairs Officer at Mobile Diving and Salvage Unit TWO. He spent five weeks on the Monitor project this summer, and made three dives on the wreck.

MONITOR

Historical Background

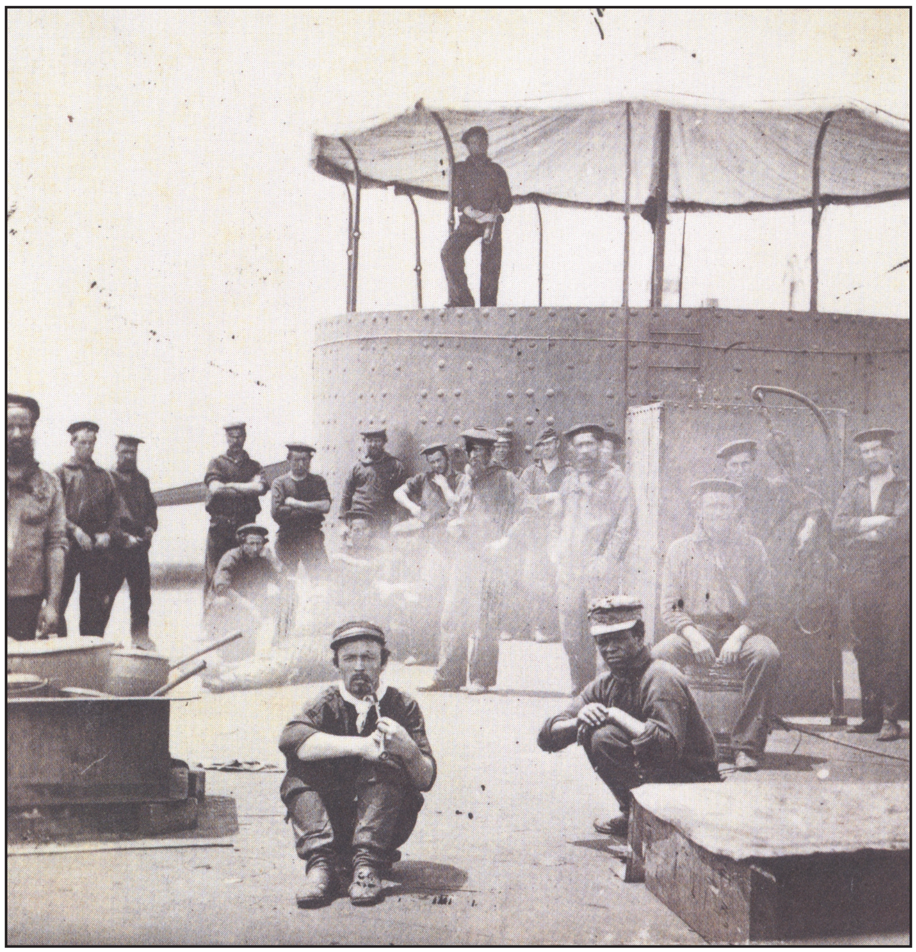
Prepared by John Broadwater, Dina Hill, and Jeffrey Johnston

History:

For more than a century after it was lost at sea, the USS *Monitor* lay undiscovered off the coast of North Carolina. It was not until August 1973 that scientists aboard Duke University's research vessel *Eastward* located the wreck in 235 feet of water, 16 miles south-southeast of Cape Hatteras. The wreck lies upside down and has suffered considerable deterioration and structural damage. In addition to natural deterioration caused by the elements, the wreck may have been damaged by unauthorized human activities.

On January 30, 1975, the Secretary of Commerce designated the wreck of the USS *Monitor* as the nation's first marine sanctuary, to be managed by the National Oceanic and Atmospheric Administration (NOAA). *Monitor* National Marine Sanctuary regulations prohibit anchoring, stopping, trawling, or drifting without power; salvage or recovery operations; using diving, dredging, wrecking devices, underwater detonation, drilling, and laying cable without a permit from NOAA. Private research activities in the Sanctuary are carried out under permit.

The *Monitor* was placed on the National Register of Historic Places in 1975 and was designated a National Historic Landmark on March 9, 1987, the 125th anniversary of the *Monitor*-*Virginia* battle.



MONITOR and its crew.

The Ship

The USS *Monitor* was undeniably one of the most significant ships in U. S. history. The hull of the USS *Monitor* was completely unique in construction and appearance. The ship was built in two sections, the upper and lower hulls. The upper hull, with its armored deck and sides, protruded only 13 inches above the water and provided a platform for the armored gun turret and small pilot house. The smaller lower hull was well below the waterline, thus was protected from enemy fire.

The *Monitor* was very similar to a submarine in that the hull was almost com-

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pletely under water and, unlike any previous naval vessel, all living spaces were below the waterline. Officers and crew lived forward of the midships bulkhead, their only view of the outside world gained through tiny deck lights, small glass ports in the armored deck above their heads.

The *Monitor's* famous revolving gun turret was nearly 22 feet in diameter, 9 feet high, its sides consisting of 8 inches of iron armor. Inside were two 11-inch Dahlgren smoothbore cannons, the ship's only armament.

The Wreck

The *Monitor* lies upside down on a relatively flat sandy bottom at a depth of 235 feet with her bow oriented almost directly east-west. The Gulf Stream is the prevailing current in the Sanctuary, generally passing over the wreck in a northeasterly direction. In the vicinity of the Sanctuary, an area often referred to as the Graveyard of the Atlantic, the warm waters of the Gulf Stream interact dynamically with cold water intrusions associated with the southerly flowing Labrador Current, creating unpredictable currents and eddies. As a result, environmental factors such as weather, surface sea condition, current, water temperature and bottom visibility change rapidly and without warning.

The inverted hull rests on the displaced and inverted gun turret. The port side is just over a foot above the bottom at the bow, but rises to almost nine feet at the stern. Most of the starboard armor belt is buried in the bottom sediment, providing some support to the hull. The hull has deteriorated to a considerable degree. Virtually none of the lower hull forward of the midships bulkhead remains standing. The only relatively intact portion of the lower hull is the area over the galley and engineering spaces aft of the midships bulkhead. All of the associated framing and side plating on the port side lower hull is missing, exposing the area to the strong currents that often sweep through the sanctuary.

Significant changes have been noted at the site in recent years by NOAA and NOAA-permitted expeditions. The majority of the changes have occurred from the midships bulkhead aft. In 1991, an anchoring incident by a private fishing vessel caused drastic and accelerated changes to the wreck. The vessel's anchor snagged the rudder/propeller shaft support skeg and pulled it to starboard. The result was the plating at the stern ripped open, exposing the aft areas of the engine room and initiating a chain reaction of structural collapse that continues.

NOAAs Actions to Preserve the *Monitor*

By 1995, NOAA had accumulated enough data to determine that the *Monitor* 's hull was deteriorating rapidly and that the famous warship could virtually disintegrate within a few years unless action was taken to preserve her. As a result, NOAA's Marine Sanctuary Division developed a comprehensive preservation plan entitled, "Charting a New Course for the *Monitor*." The plan outlined a variety of possible options and recommended a combined strategy of hull stabilization and selective recovery of key hull components for long-term conservation, curation and exhibition.

Following acceptance of the comprehensive plan, NOAA initiated an ambitious series of site investigations designed to collect the engineering and archaeological data necessary for the development of a detailed engineering and archaeological proposal. In 1998, and again in 1999, NOAA, with assistance from the U.S. Navy, the National Undersea Research Center at the University of North Carolina at Wilmington, the Cambrian Foundation, The Mariners' Museum, and others, conducted engineering and archaeological surveys, recording data on the condition of the *Monitor*'s hull, with emphasis on the stern areas that are the most unstable. During the 1998 mission, divers from Mobile Diving and Salvage Unit Two (MDSU Two) partially stabilized the *Monitor's* hull by removing her propeller and an eleven-foot section of her driveshaft. In 1999 divers from USS *Grasp* and MDSU Two conducted an extensive survey of the wreck in order to plan for continued stabilization and the recovery of major components, including the engine, a segment of armor belt and, ultimately, *Monitor's* famous gun turret.

John D. Broadwater, NOAA
Mission Chief Scientist
John Broadwater has been the Sanctuary Manager for the Monitor National Marine Sanctuary since 1992, during which time he has directed numerous NOAA scientific expeditions to the Sanctuary. He will serve as Chief Scientist for Monitor 2000.

Dina B. Hill
NOAA Shore Support Coordinator
Dina Hill is the Education Coordinator for the Monitor National Marine Sanctuary. Responsibilities include development and implementation of an education plan for the sanctuary. Dina attended Old Dominion University and the University of North Carolina Wilmington with majors in history and archaeology.

Jeff Johnston
NOAA Project Historian
Jeff Johnston has been a contract research assistant with the Monitor Sanctuary since 1995. During the 1998 Monitor Expedition he provided topside support for recordkeeping, historical background information and detailed information on the design and construction of the Monitor, as well as the details of the wreck site. He will serve the same role in 2000.

Obituary

Captain Bruce B. McCloskey USNR (Ret)

7/3/1912 – 3/12/2000

The story of a three-year old who eluded his parents during a family outing and was found on the dock at the foot of C Street in Eureka came full circle eighty-five years later. On what would have been his eighty-eighth birthday his wife, three children, and eight grandchildren, together with a group of close friends and relatives, boarded the Madaket shortly after 3 P.M. from that location for Bruce's last boat ride.

Madaket, owned by the Humboldt Bay Maritime Museum is, at 90, the oldest passenger-carrying vessel in continuous service in the United States.

With flags at half-mast Madaket, on which Bruce in his youth had commuted to work, headed for sea. No one could remember having seen Humboldt Bay more beautiful with its calm waters sparkling in the bright sunshine. A flight of pelicans flew low over the water as if they, too, were participating in the farewell.

The tide was ebbing strongly when we reached the entrance where Captain Leroy Zerlang spoke a few appropriate words after which Denis scattered Bruce's ashes, while Jenner (Jennifer) as oldest grandchild, read Tennyson's poem "Crossing the Bar", after which Timothy proposed a toast to his father to which we all raised our champagne glasses.

A lovely wreath followed the ashes, trailed by all the beautiful individual blossoms with which friends had come laden, and Madaket solemnly circled the site sounding the traditional farewell whistle blasts.

A message of condolence was received from the Coast Guard Station as we passed on our return trip. And, to round out a proper salvor's voyage, Madaket took in tow a disabled boat. We felt that everything had conspired for an exact fulfillment of Bruce's last wishes.

Editors Note: Bruce was always a close supporter of the Supervisor of Salvage dating back to the days of Bill Searle. All of us, particularly in the Diving and Salvage community have lost a close friend.

(Continued from page 15)

Seal Delivery Vehicle Team One ready for action!

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CW02 Strynar is the Command Diving and DDS Officer at SDV Team ONE.

Navy Experimental Diving Unit Testing Medical Equipment to Improve Capabilities of US Hyperbaric Chambers

By: CDR Robert Lowe

A US Navy diver develops equipment problems, runs out of air, panics, and rushes to the surface. Inadequate exhalation results in a severe case of Cerebral Arterial Gas Embolus (CAGE). Shortly after surfacing, he collapses, unconscious and barely breathing. An ambulance meets him at the dock, and paramedics administer oxygen, insert an endotracheal tube, and place him on a cardiac monitor. Vital signs, oxygen saturation and cardiac rhythm are continuously monitored during the twenty-minute ride to the hyperbaric chamber. A simple mechanical ventilator provides assisted breathing while the single paramedic administers intravenous medications to stabilize his precarious cardiac rhythm.

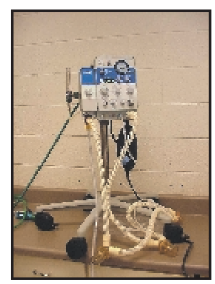
Propac Cardiac Monitor.

Upon arrival at the hyperbaric chamber for lifesaving recompression treatment, the Chamber Supervisor informs them that the monitors must be removed, and they can only ventilate the patient using a hand-held Ambu-bag, because none of the critical care devices being utilized are approved for chamber use. The attendants and Dive Medical Officers (DMO) struggle for the next few hours to care for the patient with the crudest of equipment. They can not verify adequacy of ventilation, and manual Ambu-Bag ventilation ties up one attendant almost full time. Unable to monitor any continuing irregular heart beats, they are severely limited in the drugs they can administer, due to the inability to accurate control an intravenous administration rate. Even listening to the lungs and measuring blood pressure are difficult in the noisy, crowded chamber.

The preceding tale is not entirely fictitious. Though uncommon in the operational diving Navy, this, or a similar scenario, occurs several times a year to either divers or non-divers undergoing life saving hyperbaric medical treatment. Fortunately, historically safe Navy diving procedures preclude many of us from seeing this problem. Any operational unit, especially if associated with a DMO, may be referred such a critical patient. The general and even aerospace medical communities possess extensive capabilities to treat such severely ill patients. The Navy's diving medical community is sorely lacking in a similar ability There are extensive lists of valuable medical equipment that are routinely used in hospitals, ground and air ambulances, and other emergency care settings that currently can not be used in US Navy hyperbaric chambers. Minimal research has been accomplished in the past to formally evaluate medical equipment for hyperbaric safety and clinically appropriate function. Cardiac monitors, suction apparatus, pulse oximeters, ventilators, intravenous infusion pumps, digital thermometers and patient warming devices are but a few of the potential life saving tools that could augment hyperbaric medical care. A group of Diving Medical Officers and Corpsmen at the Navy Experimental Diving Unit in Panama City, Florida has been evaluating such equipment for ultimate approval for hyperbaric use and placement on the Authorized Navy Use (ANU) list. The goal is to be able to provide state of the art critical care medical support to patients in hyperbaric chambers if the need arises.

CDR Robert Lowe, MC, USNR, and LCDR Gary Latson, MC, USNR, and HM1 Daryl Stanga and other technical experts at NEDU have already tested several devices and found them to be hyperbaricly safe and clinically accurate. A cardiac monitor, several models of pulse oximeters and a carbon dioxide detector have been found ready for submission for ANU listing. Testing is in progress on several promising ventilators. All equipment is evaluated for electrical safety and absence of harmful off-gassing before pressure testing to 165 fsw. If the device successfully clears these hurdles, it is evaluated in either the manned or un-manned chamber for clinical function and accuracy at depth.

If all results are favorable, a recommendation is made to NAVSEA, the certifying authority for diving and hyperbaric equipment, and the equipment is placed on the ANU list of equipment. This effort is in an early stage, but with approval of additional funding, should accelerate the process in the coming year. With ANU approval, appropriate hyperbaric units can, with the input from their DMOs, decide what critical care equipment would be most useful in their diving setting. For information, contact the authors: DSN: 436-3100 or Commercial: (850) 230-3100. We welcome suggestions from the fleet regarding any suggested equipment testing.



Ventilator undergoing tests.

CDR Robert Lowe had been an Undersea Medical Officer for NEDU since July 1999. He is also a Board Certified Emergency Physician who joined the Navy in September of 1990.

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were flooded and the wreck was placed back on the bottom. A further modification in the placement of the pontoons was made, and the wreck was finally raised on 5 July and delivered to the Brooklyn Navy Yard on 7 July 1926.

While John made many technical innovations and calculations in support of the operation, the salvage depended on diving. More than 500 dives were made in a depth – 132 feet – considered quite deep for the time. Much of the work required divers to enter the sunken submarine. These tasks were practiced in full diving dress in the S-50. As a result of his experience, John prepared a detailed report on preparations that would be needed, if another submarine went down on the high seas.

Just over two years later, 17 December 1927, the S-4 sank off Provincetown, MA in 102 feet of water on a soft mud bottom after collision with USCGC PAULDING (DD 22). A special tragedy was that six survivors were trapped in the sunken hull, but could not be recovered before they died from carbon dioxide poisoning. By that time, John Niedermair was supervisor of scientific section for the Brooklyn Navy Yard. Although the first Naval District's Boston Navy Yard was the base for this new salvage effort, RADM Plunkett, recalling John's work on the S-51, called him in to commence planning the new operation, then ordered him to the site to serve as technical advisor to the salvage officer, Commander (later Captain) Harold Saunders, detailed from the Portsmouth Navy Yard. CAPT Ernest King again was officer-in-charge of the operation. As one might expect, John experienced some resistance from the Boston folk when he showed up to "assist" them. But CAPT King knew him well from the S-51, and he soon earned the respect of CDR Saunders for his intuition in the basic naval architecture problems of buoyancy and stability associated with submarine salvage operations. The lessons of the S-51 had been learned well. Careful attention to detail in the planning and use of techniques and procedures proven on S-51 ensured a smooth operation. The ship was raised and towed to Boston just three months after her sinking.

John was transferred from Brooklyn to the Bureau of Construction and Repair (subsequently the Bureau of Ships) in Washington DC in 1928. He served as the U.S. Navy's technical expert in London for the 1929 International Safety of Life at Sea Convention. In 1938 he was appointed civilian chief and Technical Director of the Bureau's Preliminary Design Branch, in effect chief naval architect of the Navy, and served in that capacity for the next twenty years. He was responsible for the basic design of all types of naval ships, battleships, aircraft carriers, cruisers, destroyers, submarines, patrol and mine craft, auxiliaries, landing ships and craft, and other special types during that critical period. In a 1975 personal letter to John, RADM Edward Ellsburg wrote, "In my life time (I am now eighty three) in many fields in war and peace, three men stand out in my memory from the thousands with whom it has been my good fortune to have fate throw me into contact – a strange three perhaps – Captain Henry T. Wright, Fleet Admiral Ernest J. King, and John C. Niedermair.

Sources:

- "The Reminiscences of John C. Niedermair" Oral History Department, U.S. Naval Institute, Annapolis, MD January 1978.
- "Mud Muscle, and Miracles – Marine Salvage in the United States Navy" CAPT C.A. Bartholomew, USN
- Naval Historical Center and Naval Sea Systems Commmand, Department of the Navy, Washington, DC 1990

CAPT Miller was commissioned in 1940 as a Naval Constructor on his graduation from the Webb Institute of Naval Architecture, and became an Engineering Duty Officer. He earned the Degree of Naval Engineer at MIT after World War II. His naval career included tours as Head of the Preliminary Design Branch, Bureau of Ships; Commanding Officer and Director of the U.S. Navy Mine Defense Laboratory, Panama City, FL at the time Sea Lab I was designed and built and the Navy's experimental diving activities were being transferred to that location; and Director of Ship Design, Naval Ship Engineering Center, Washington, DC. He retired in 1968.

Gulf Air Flight 72

At about 1930 on Wednesday, August 23 2000, Gulf Air Flight 72 crashed in the water while attempting to land at Bahrain International Airport. The crash site was about six miles away from where the USS George Washington (CVN 73) was anchored. Based on initial reports of a "controlled ditch" the personnel of the George Washington Battle Group EOD Detachment proceeded toward the site expecting to assist in the rescue of passengers. It soon became obvious that this was not a SAR effort but a recovery one. The EOD techs assumed leadership roles in prioritizing recovery efforts, instructed inexperienced coxswains and boat officers in nighttime navigation in reef and sand bar filled waters, and provided a calming influence to other on-scene personnel. The EOD divers used the AN/PQS 2A sonar to locate one of the flight's data recorders and assisted in the recovery of bodies and personal effects, classified material, and parts of the airplane. Their outstanding performance was noted at all levels of command and once again demonstrated the readiness and "can do" spirit of our Navy's Sailors.

The Old Master

By: MMCM(MDV/SW) Russell W. Mallet

Although the Monitor 2000 mission was responsible for recovering numerous artifacts, successfully testing the new HEO2 procedures, and certifying the EXO band mask, I am going to focus this article on the sailors that I had the pleasure of working for and with during the past 37 days. Throughout this article I'll be mentioning some names, so please take note. You will probably hear about them again if you are around long enough.

Let me start with the officers. At no time have I ever seen so many eagles on a dive side, all working together for a common goal. From an enlisted point of view it was refreshing to observe the high level of professionalism, experience, and common sense approach to various tasks during the operation. The officers on Monitor 2000 readily filled positions on our dive side from Tending Green Diver to Diving Officer as well as performing as Red Diver. Our day to day Diving Officer and OIC of Detachment Bravo, CWO3 Hulsizer, worked hand-in-hand with the Master Divers. His involvement greatly enhanced the training and qualification of the sailors who were U/I at various positions.

Never before have I had the opportunity to work during a diving operation with multiple Master Divers. New Masters are highly encouraged to sit down with or call BMCS (DSW/MDV) Brown, who was the lead MDV. You will be impressed and will be a better diver for it. The fellowship, wealth of experience, and "can do" spirit displayed was not only of benefit to the Commanding Officer, but was an example I hope, for the rest of the troops to emulate.

At the onset of the operation, I observed an empty barge with no habitability. Within days it was transformed into a craft not only capable of conducting diving operations, concrete mixing, and salvage rigging, but also able to provide living and eating quarters for all involved. Working in extreme heat and long hours, BM2 Blanchard and other boatswain's mates ran PVC lines under living quarters for the CHT system. HT1 Turner, BM2 Lana, HT2 Cowan and other HTs cut and welded, removing rails, installing tuggers and other equipment. MMC Riendeau, HMC Allison, EN1 Hordinski and other ENs and MMs rigged machinery and tested everything to ensure a successful operation. EMC St. Peter and EM2 Stewart stayed busy wiring electricity throughout this man made city. MDSU 2 support personnel SK1 Pack, ET2 Hardie, BM3 Thompson and YN Jet volunteered to take on the responsibility for making water. Oh yeah, so we could get into an eight point moor all the anchors and wire had to be rigged. BM1 Annon did a fine job supervising this evolution. When they had stopped work for the night they might have looked like whooped puppies, but not once did I hear any complaints. Seeing how well these sailors performed even before getting underway assured me that the Monitor Mission could only get better. Once in the moor and after the bugs were worked out on dive station, the side operated as a team, each knowing the others job or trying to qualify at that position. Imagine that. Just what we all dream of. Each time a new crew of replacement divers arrived, there was only enough time for a quick turnover, a thanks, goodbye and they were either put right in on station or utilized for a particular phase of the bridge frame rigging. Most of you know how dive station goes. When the window is open you must utilize whatever time you have. Long days and nights, wet soggy feet, hot blistering sun or long idle periods between dives did not waver the spirit or crack the morale of these divers. Each time a problem arose or something broke, I never heard why we couldn't go on, but rather it was always what will it take to fix the problem. One example is a problem with our stage wire getting pinched on the spool. When we went to bed that night HTC Baker and HT2 Mabry put their heads together and manufactured a piece underneath the spool to prevent the wire from whipping and getting pinched. By the next morning new wire was installed and the divers winch was operable. I could easily give more examples of the creativity displayed out there, but you seniors, being divers yourselves, already know what I am

(Continued on page 24)

MDV Mallett.

From the Supervisor of Diving

Captain Chris Murray

Revised Surface Supplied HEO2 Diving Procedures and Tables

The revised procedures are currently in use by Mobile Diving and Salvage Unit ONE in Pearl Harbor and Mobile Diving and Salvage Unit TWO in Little Creek. Naval Diving and Salvage Training Center will start using the new procedures with their next dive class and next Master Diver Evals. Chapter 14 in the dive manual has been revised and is awaiting final approval. The new Chapter 14 will be issued with change A to the dive manual during the first quarter of FY01.

What do the new tables and procedures consist of?

Dr. Ed Flynn's article addresses the why and how we got to the new procedures. I will give an abridged version of what the main changes consist of:

- The decompression mix has changed from 60/40 HE/O_2 to 50/50.
- Shift to 50/50 at 90 feet vice 100 feet for in water decompression.
- The 50 and 40 foot in water stops are on 50/50.
- First chamber stop is 15 min at 50 feet on 100% O2 and then 15 min at 40 feet.

The rest of the chamber stops remain the same.

You will find that the decompression times are very few increases in decompression times until you get to exceptional exposure. The exceptional exposure O2 periods increase significantly in some cases. You find other procedural changed that should make mixed gas diving easier.

I would like to thank Dr. Ed Flynn, MDV Davidson, MDV Young, and NEDU for their support in bringing these revised tables and procedures to reality and assisting in getting approval to take these tables directly to sea for validation. Mobile Diving and Salvage Unit TWO did the initial at sea testing on the USS MONITOR. It was one heck of an operational evaluation diving under the arduous conditions off Hatteras, North Carolina in up to 240 feet of water. Mobile Diving and Salvage Unit ONE also supported the at sea evaluation by filling in some additional dives from depths of from 100 to 300 feet.

Navy Standard Chamber

The first new Navy standard chamber is on its way in FY01. The chamber is to replace the 60-inch aluminum double lock. The chamber will have four bibs in the inner lock and four in the outer lock, air, O2 and mixed gas in the inner, and air and gas in the outer. It is intended to support two patients and two tenders. It will be outfitted with a CO2 scrubber, heater/chiller and CO2 and O2 monitors. The container box will be 8'x8'x20' and will have lighting, A/C and heating.

For more details you can contact Mr. Stuart Yee at (703) 607-2766 x 274 or e-mail yeesm@navsea.navy.mil.

(Continued from page 23)

trying to point out. For the divers who are Chiefs out in the fleet who haven't qualified as dive supervisor or haven't put a package in to go to Master Diver evaluations, look out! I saw some first class divers take the watches and run some good **HEO2 WORKING DIVES** in 230 fsw utilizing the new procedures. BM1 Annon, EN1 Hordinski , HT1 Coffelt and HT2 Mabry to name a few. If they make Chief, they not only want your job, but mine as well. I hope it's an indicator of what is coming up in the ranks within our community and if so, HOO YAH.

In closing, I know this article does not do true justice to all of those personnel who contributed to the success of Monitor 2000 Expedition. The intent on my part was purely selfish. It was an opportunity for me to express the pride I have, not only for MDSU TWO divers but the community as a whole.

MMCM(MDV/SW) Russell W. Mallet is currently assigned as Command Master Chief at Mobile Diving and Salvage Unit TWO.

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