



FACEPLATE

The Official Newsletter for the Divers and Salvors of the United States Navy
Volume 9, No. 1 / February 2005



**Saturation Diving
Then...Now...and Tomorrow.**

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

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

Captain Jim Wilkins, USN
 Director of Ocean Engineering
 Supervisor of Salvage and Diving
 NAVSEA 00C
wilkinsjr@navsea.navy.mil

Captain Mark Helmkamp, USN
 Supervisor of Diving
 Editor In Chief
helmkampmt@navsea.navy.mil

LCDR Jim Bladh, USN (Ret.)
 Managing Editor
jimbladhsr@aol.com

BMCM (MDV) Steve Smith, USN
BMCM(SW/MDV) Fred K. Orns, USN
 Fleet Liaison Editors
smithss@navsea.navy.mil
ornsfk@navsea.navy.mil

Zoya Gorbunova
 Production Editor
zgorbunova@roh-inc.com

Otto C. Adams
 Graphic Designer
oadams@roh-inc.com

SUPSALV SENDS

First – CONGRATULATIONS to our SEALAB community on the celebration of their 40th anniversary! As should quickly be evident, we’ve dedicated much of this FACEPLATE issue to heralding the accomplishments of the early “Man-In-The-Sea” Program.

But as anyone currently in uniform can tell you, the pace of change in the Navy today seems staggering...so I thought I’d use this “SUPSALV SENDS” as an update on important initiatives in the Navy Diving and Salvage Program –

ARS 50 Class – Since my last “SUPSALV SENDS”, the CNO did, in fact, approve the conversion of the four ARS 50 Class vessels to become T-ARSS operated by the Military Sealift Command, beginning in FY06. The principal reason was to reduce overall cost to the Navy. The current plan (subject to change) is for the two East Coast ships (USS GRASP and USS GRAPPLE) to be converted in FY06, followed by PACFLEET’s USS SALVOR and USS SAFEGUARD in FY07. All of the diving billets on each of the 4 ships are being retained and converted to become five new MDSU ONE and TWO diving detachments to support deployment on the T-ARSS much the same as currently occurs on the T-ATFs. MSC is developing a robust Salvage Training Program to integrate their professionals with the MDSUs to ensure that USN salvage capability is not just retained but improved.

Navy Diver Rating - The Center for EOD & Diving (CENEODD) continues to blaze the trail for our new Navy Diver Rating (as well as an EOD Rating). These two ratings will replace the current 19 Diver and 22 EOD source ratings. This initiative has been briefed to a number of flag officers and MCPON over the past 12

months and received strong endorsement. The last few months focused on developing the right E7/E8/E9 force structure for the new ratings recognizing the unique requirement of a senior enlisted force to bring mature, operational expertise and high levels of leadership skills to bear on our high risk operations. Healthy advancement opportunities through E9 must be included. Staffing standards are being developed for both communities and will be applied throughout the force by the end of this fiscal year to determine the proper structure. When completed, the proposed force structure will be briefed through the USN chain of command for approval and implementation as soon as possible.

Saturation Diving System – FY06 procurement of the Navy’s CNO-approved air transportable saturation diving system (to be known as SAT FADS for Saturation Fly-Away Dive System) is being planned! The system will be operated by MDSU TWO Deep Diving Detachment, augmented by a cadre of NEDU saturation Divers who also maintain it in ready-service at Panama City both for training missions (NDSTC) and operational missions. Start thinking about whether saturation diving is part of your future!

Diving Warrant Candidate Recommendations – The 2003 MDV/CWO Conference recommended that candidates for Diving Warrant (1) be qualified at the highest level of Diving Supervisor at their current command, and (2) have successfully passed the written MDV course pre-test administered by NDSTC. A recent Salvage Executive Steering Committee approved and forwarded the recommendation to BUPERS. Forewarned is forearmed for you aspiring DWOs.

(SUPSALV SENDS continued on page 6)

In This Issue

| | | | | | |
|--|---|--|----|--|----|
| SUPSALV Sends | 2 | Brings Home The Bronze | 6 | Navy Divers Find a New Dive Buddy | 16 |
| Next Generation Dive System Update | 3 | The Non-Technical Causes of Accidents | 7 | Diving Systems Certification Notes | 18 |
| Tom Salmon’s Retirement | 4 | “Papa Topside”, Captain George F. Bond | 8 | Rapture of the Deep | 19 |
| Mark V Monument at the WNY | 4 | Historical Diving Society USA | 9 | Hard Hat History | 20 |
| Divers Alert Network New President | 5 | One Navy Diver’s “Excellent” Adventure | 10 | Command in the Spotlight | 21 |
| From the Managing Editor | 5 | U.S. Navy SEALAB II | 12 | The Old Master...(Jake’s Corner) | 22 |
| Daughter of Former NEDU CO and SUPSALV | | Deep Kim Chi | 15 | Topside; Red Diver...From SUPDIVE | 23 |

Next Generation Dive System Update

ORCA Prototype Diving in Guam

By: MDV Steve Smith

In October of 2004, Guam's COMNAVMAR dive locker with Divers from NEDU, NAVSEA, and area commands, field-tested the Oxygen Regulating Console Assembly (ORCA). In addition, some hardware for the Next Generation Dive System (NGDS) was tested, such as transducers, digital depth gages, and a computer system. The ORCA enables Divers to decompress in the water using oxygen delivered at the 30 and 20 foot stops. In order to use oxygen in the water, NEDU modified the V-VAL 18 decompression algorithm to be adaptable for surface supplied dives capable of receiving O₂ in the water.

The ORCA is a transportable console designed to be compatible with all current USN Diver air systems. All the Diver's air, with the exception of the pneumo, is passed through the ORCA. For decompression, HP oxygen is reduced at the ORCA, or an LP port is available to allow use of a TRCS O₂ rack, and passed to the Diver. Additional deck space was required for the ORCA and the oxygen K bottles, but it was not a serious impingement on the available



Part of the ORCA dive team.

workspace. A total of 84 surface supplied dives were completed using the ORCA, ranging from 87 to 188 feet. Bottom times ranged from 14 to 43 minutes. Seventy-eight of the dives were decompression dives, some requiring as much as 24 minutes of decompression. Six oxygen K bottles were used during the entire evolution, which was less than anticipated.

The ORCA console worked extremely well and Divers had no trouble operating it. There were some minor design change recommendations which we will most likely incorporate. The OPs were simple, easy to follow, and the Divers were never aware of any shifting of gases taking place topside.

The hardware did not fare as well, particularly the transducer. It failed to operate successfully for the full day because of its fragile electrical connections. NEDU is looking for a "Diver friendly" model that can take the constant punishment that our equipment goes through.

One additional bit of data that we gathered was comparing the decompression required from the V-VAL 18 square dive table and schedules to the decompression obligation computed by the V-VAL 18 Dive Planner which used the Diver's actual depth and bottom time. The use of the Dive Planner resulted in a significant saving. For example, a dive that

is 115/26 must be decompressed using 120/30 table and schedule resulting in a decompression obligation of 15 minutes on O₂ at 20 feet. When we put this information into the Dive Planner, the decompression obligation was shortened to just 6 minutes on O₂ at 20 feet - a 60% reduction in decompression time for this particular dive. Use of the Dive Planner for the entire mission would have cut the total decompression time by 38.6%!

On another note, MDV Jim Carolan from NEDU made his last Navy dive before retiring after 30 years of service and MDV Davidson made his last dive before converting to the wardroom. In addition, MDV Stogdale, MDV Shank, MDV Pratschner, MDV Neely, and I dove on this protocol.

HooYah MDVs!!!



MDV Carolan's last Navy dive.

Bottom line is that we, old farts, only get into the water when it is warm and clear. Beware if you are planning a dive job in Bermuda, because we will see you there. The flip side is, you cold-dark-water guys can relax, we won't be there looking over your shoulder. Brrrrrr, it's too cold!

MDV Smith is currently Fleet Master Diver at NAVSEA 00C.



*So why do you want to be a Warrant?
(Because we need good #1 tenders, Sir!)*

Tom Salmon's Retirement

Mr. Tom Salmon, Director of Salvage (NAVSEA 00C2), is retiring after 34 years of U.S. Navy salvage work. From early on, Tom felt the call to duty from his country and was commissioned as a Naval Officer in 1968. He graduated from U.S. Navy Dive School in 1969 and was assigned to USS GRAPPLE (ARS 7) as the Diving Officer, completing a WESTPAC tour in Vietnam.

After his initial ship tour, he transferred to Naval Support Facility (NSF) Da Nang for a 12-month tour as the Diving and Salvage Officer. His time in Vietnam was spent recovering capsized and sunken boats, barges, dredges and forklifts, downed helicopters and planes, performing underwater ship husbandry, and even recovery of a Naval Academy class ring. He spent 3 years in the Navy and then joined the Reserves as the Executive Officer of the Reserve Harbor Clearance Unit in Long Beach, California.



Tom Salmon.

He continued his work in Navy salvage by becoming part of NAVSEA 00C, Office of Supervisor of Salvage and Diving, in 1975. Mr. Salmon has provided superior service to the Navy and the U.S. government over his entire civilian career spanning 29 years. His contributions and continuity of 34 years of U.S. Navy salvage experience provided the basis for the U.S. Navy to have the rapid response capability for safe search and recovery of anything that fell into the water. He was directly responsible for providing the Navy, Federal, and other agencies with the necessary expertise and national response capability to perform any salvage or oil recovery operation anywhere, anyplace, anytime.

He was primarily responsible for the successful search for and recovery of numerous items from the oceans that were of significant importance to the Navy and the nation. He started as one of 00C's salvage experts and worked his way to become the Head of 00C's Salvage Division. During his illustrious career, he was responsible for literally hundreds of successful salvage operations, many of which had significant impact on the entire nation. Mr. Salmon is NAVSEA's and the nation's primary authority on deep sea salvage. He has done it all.

Mr. Salmon participated in, and in many cases, led the efforts for recovery of components from crashed commercial aircraft including Korean Airlines Flight 007, Air India Flight 182, South African Airways Flight 295, United Airlines Flight 811 cargo door, Alaska Airlines Flight 301, TWA Flight 800, AeroPeru Flight 603, Swiss Air Flight 111, and Alaska Air Flight 261. These recoveries have led to increased flight safety for the general public.

He was a key participant in the recovery of oil spilled from T/V EXXON VALDEZ as well as the recovery of victims from F/V EHIME MARU. He supported the recovery of debris and victims from Space Shuttles CHALLENGER and COLUMBIA. Over the years, he was responsible for the recovery from deep ocean depths of material from dozens of crashed military aircraft and lost weapons leading to the increased safety of our military aircraft. During his tenure as NAVSEA 00C2, one of the recoveries included a Marine Corps helicopter, which was recovered from a record setting depth of over 17,200 feet.

When Tom retires, his expertise and continuity will not only be sorely missed, but will be a gap hard to fill for many years to come.

LCDR Brian D. Lawrence is Assistant Supervisor of Salvage at NAVSEA 00C.

Managing Editor's Note

I personally worked with and for Tom during his entire tenure at the Office of the Supervisor of Salvage. I have had many supervisors during my 58 years with the Navy, 40 of these years were within the salvage and diving community. I rate Tom as one of the best that it has been my privilege to work for.

Mark V Monument at the Washington Navy Yard

A Brief History

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



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

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

Donation Request

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

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

Please send your tax-deductible contribution to:

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

A certificate of appreciation will be mailed to each donor. Please make check payable to "Mark V Monument." Contact Bob Barth at bob.barth@mchsi.com or Doug Hough at (850) 235-4101 or momits@bellsouth.net if you have any questions.

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



Divers Alert Network Names Dr. Michael Curley President

By: DAN Staff

After a year-long executive search, Divers Alert Network has named career Navy officer and research psychologist Michael D. Curley, Ph.D., as its President and Chief Executive Officer. The appointment became effective March 1, 2004. In announcing the appointment, Acting DAN CEO and President, Dan Orr, echoed the Selection Committee's choice. "Dr. Curley brings a wealth of experience and expertise to DAN America," Orr said. "We are confident that he will lead DAN into a new era of growth and development in diving medical research. Dr. Curley will help DAN continue to promote its mission in diving safety and foster the dissemination of critical information as a partner in the global diving community. On behalf of the DAN staff, we welcome Dr. Curley and his wife, Elaine, to the DAN family."

From 1999 to 2002, Dr. Curley served as medical adviser for Chief of Naval Operations Submarine Escape and Rescue Working Group, Navy Medical Research Scientific Advisory Board, and Pressurized Submarine Escape Training Group. During that time, he served as CEO of a multifaceted biomedical research, development, training, and education facility, directing submarine survival, escape, and rescue initiatives.

From 1997 to 1999, he was the first Naval Biomedical Program manager for diving safety and performance, submarine escape, and rescue.

From 1992 to 1996, Dr. Curley was technical director for all aspects of the Naval Submarine Medical Research Laboratory on the Submarine Base in New London, CT, where his duties included resource generation, personnel management, budget execution, program planning, product delivery, and more.

From 1992 to 1994, he was executive officer of the laboratory. Technical programs undertaken included the following: 1) the effects of low-frequency sound on Divers; 2) submarine-related decompression problems; and 3) submarine escape and rescue.

From 1992 to 1996, he served as the U.S. Department of Defense medical adviser on the effects of low-frequency sonar on recreational and military Divers. He led the medical team, which coordinated all human research and exposure policy. He was the senior person and the only medical representative on the Executive Steering Group, which included engineers, lawyers, and environmental experts.

From 1977 to 2002, Dr. Curley was an active duty Naval Officer. He worked as research psychologist in the Diving Medical Department, Naval Medical Research Institute, Bethesda, MD; research psychologist, human factors engineer, Navy Experimental Diving Unit, Panama City, FL; research psychologist in the Diving Medical Department, Naval Medical Research Institute; and as head of Performance Physiology Division, Behavioral Sciences Department.

In 1978, Dr. Curley graduated from the U.S. Navy Diving Medical Officer Course, and in 1983 he earned designation as saturation Diving Officer. He supervised 11 research saturation dives (depths to 1,106 fsw) and more than 700 experimental, non-saturation dives using mixed gas or 100 percent oxygen for breathing. As an experimental Diver on saturation, oxygen exposure, decompression table development, and equipment test dives, Dr. Curley himself accomplished more than 400 dives.

He also operated the 1-Atmospheric Diving System JIM, and was a lecturer at the U.S. Navy Diving School and Naval Undersea Medical Institute. Dr. Curley will lecture at several events this year.

He co-wrote more than 100 presentations and penned 20 technical papers for NEDU. PADI and YMCA certified in 1976, Dr. Curley has accumulated more than 200 recreational dives and is looking forward to more diving during his tenure at DAN.

From the Managing Editor

This edition of Faceplate is particularly close to me. It brings back many fond memories of my past association with the Diving Navy. I first met Bob Barth and the SEALAB Divers during my tour at the then Mine Defense Laboratory in Panama City. As the MDL Diving Officer, I was involved in safety and training for the SEALAB crew. I had some exceptionally good Divers in my Diving Locker. They were so good that Dr. Bond, Walt Mazzone, and Bob Barth recognized their value and incorporated them into the SEALAB crew, namely, Wilber Eaton, Paul Wells, and Don Risk. These Divers along with Bob Sheets, made the mission impossible to be anything but successful.

The Mark V Monument for the Washington Navy Yard is certainly worthwhile (see Lee Wolford's "Hard Hat History" article in the August 2004 issue of FACEPLATE and page 4 in this issue). I encourage all of you to contribute to the effort. The monument is of particular interest to me since I graduated from First Class Dive School in October 1954.

The article on Susan Bartholomew-Williams (see page 6) is meaningful to many of us. I knew Susan as a small child, from my visits to Black Bart (Captain Bartolomew). It is no surprise that Susan has achieved success at the Olympics. I remember when Susan's mother, Donna, ran marathons. It is obvious that Susan inherited her competitive spirit from her parents. A close friend of the Bartholomew family said: "It's too bad Bart wasn't here to see Susan win the Bronze medal." My reply was: "Bart saw it."

I wish to thank all of you who have contributed to FACEPLATE. Your input is what makes this an informative account of Navy Divers.

Jim Bladh
Managing Editor

Daughter of Former NEDU CO and SUPSALV

By J03 Michael Misfeldt

Brings Home The Bronze

Panama City, FL – Every child has a dream, whether it is to play pro ball, grow up to be the President of the United States, join the military, or be a teacher, but for Susan Bartholomew-Williams that dream was fulfilled when she walked out to compete with the United States Olympic Team in Athens, Greece last August.

Williams, who started swimming at the Bay County YMCA, always dreamed of being an Olympic swimmer. She made the team, just not for swimming.

“When I was 15, I wanted to be a swimmer on the U.S. Team. I swam morning, noon, and night but after a while I realized that was not going to happen,” Williams said. “I gave up on my dream and went to school. I got my degree and went to work like everyone else, but the bug was still there. I still wanted to be an Olympian.”

Williams was introduced to a new sport – the triathlon – in the mid ‘90s and fell in love with it. She began to train in hopes of making the 2000 triathlon team that went to Sydney, Australia, but she could not compete as she became pregnant and had to withdraw.

After her daughter was born, she went back into training in hopes of making the 2004 Team, a goal she finally accomplished, winning a bronze medal at the 2004 summer games.



Susan Bartholomew-Williams speaks at the Panama City Beach Aquatics Center ground breaking ceremony held on September 21, 2004. Susan's father was Commanding Officer NEDU from 1977 to 1980 and Supervisor of Salvage and Diving from 1985 to 1990.



2004 Women's triathlon bronze medalist Susan Bartholomew-Williams.

Williams had to start somewhere and that place was right here in Panama City, FL. Her father, Captain Charles Bartholomew, was Commanding Officer of the Navy Experimental Diving Unit from 1977 to 1980. The Panama City area, she says, is where she discovered and fell in love with swimming but only had the pool on the base to swim in. That's why she returned to Panama City Beach on September 23, 2004, for the ground-breaking of a new Aquatic Center at Frank Brown Park.

“Every time I come here, something is different. It's amazing how the community has been built up since the late ‘70s and early ‘80s. I am little sad to see the small hotels gone and it is strange to look up in the skyline and see the big buildings but it is nice that the community is involved and wants to help the kids,” she said. “This Aquatic Center will give them an advantage that I never had as a child and who knows, maybe some day down the road, Panama City will see another Olympian standing at the podium receiving their medal.”

“I am still on cloud nine. I have still not realized that I won a medal, that I was able to compete for my country and that my dream has been accomplished,” she said. Susan now is going to concentrate on coaching and her next goal is to help her husband compete in the triathlon on a professional level.

Journalist Third Class (SW) Michael Misfeldt, NSA-PC Public Affairs.

SUPSALV SENDS

(continued from page 2.)

CWO & MDV Salvage Training – Another Salvage Executive Steering Committee initiative is to send Diving Warrants and MDVs through formal salvage training at NDSTC enroute to either MDSUs or (for the short term) ARS 50 Class. This training is particularly targeted at Warrants and Master Divers who never received formal salvage training during the several years when the First Class Diver curriculum did not include salvage training. Though the curriculum is now revised, the formal training is still required. This recommendation has been sent to the Fleet for endorsement.

USN Diving Manual (Revision 5) – After 2 years of labor, the next revision to the USN Diving Manual is soon to be issued. I've run out of room to summarize the main changes, except for saying that it focuses again on providing the Diving Supervisor increased operational options (and responsibility) through appropriate use of Operational Risk Management. Rev 5 was reviewed and endorsed during the inaugural meeting of the Senior Enlisted Advisory Team (SEAT). BMCM (MDV/SW) Fred Orns is POC. Stay tuned!

Contaminated Water Diving Manual – Finally issued! We plan to add to and improve this manual over time, as it still leaves a lot unanswered...that's because there aren't many solid answers which exist for the toughest challenges of “contaminated water.” Feedback appreciated...particularly from those of you actually working the dirty water side of the business.

Working Divers Conference 2005 – To be held in Keyport WA, during the last week of March 05. Like last year, we've added a number of practical training workshops to bookend the week. Every USN dive locker should attempt to send at least one senior and one junior Diver to make sure as much training gets exported back to the entire locker as possible. See you there!

In closing... CONGRATULATIONS to Project GENESIS and SEALAB I, II, & III pioneer and aquanaut **CWO4 (ret) Bob Barth**, who's retired after decades of USN, government, and commercial diving service. Hoo-yah Deep Sea, Bob! We'll never forget. Up and over, Red Diver!

SUPSALV SENDS

The Non-technical Causes Of Accidents: *What Can Navy Diving Learn from other Industries*

In Washington, DC, Air Florida Flight 90 plunged into the ice-covered Potomac River killing 81 people on 13 January 1982. The causes of this accident included the flight crew's failure to use engine anti-ice during ground operation, the decision to take off with snow/ice on the airfoil surfaces of the aircraft, and the captain's failure to reject the takeoff during the early stage when the co-pilot had called his attention to anomalous engine instrument readings.

During the early morning of 26 April 1986 at the Chernobyl nuclear power plant in the former USSR (now Ukraine), a chain reaction in one of the reactors went out of control and created explosions and a fireball. The accident immediately killed more than 30 people, and the resulting high radiation levels forced 135,000 people to evacuate. This accident was attributed to a poor safety culture, inadequate training, poor communications, and violation of safety procedures.



Chernobyl Nuclear Power Plant.

Divers on a U.S. Navy salvage ship were approaching the completion of the recovery of an aircraft. During the early hours of 5 May 2001, on the 14th day of operations, two Divers descended 41 feet to the sea floor. In the poor bottom conditions they became disoriented and, instead of making their way to the debris field, became entangled in the anchor chain of the salvage ship. While attempting to recover the Divers, one of them was apparently struck by the anchor chain and disappeared from the rescuers' view. His body was recovered a month later. This accident can be attributed to a poor safety

culture, poor leadership, bad decision making, inadequate risk assessment, inexperience, and fatigue.

These accidents illustrate the risks of failing to understand the human and organizational dimensions of accident causation and prevention. Significant failures in human factors, or non-technical skills such as communications, decision making, situation awareness, and leadership, are not confined to those accidents described previously. Research has shown that approximately 80% of all accidents are caused by human error. High-risk industries such as aviation, medicine, nuclear power generation, and offshore oil production have acted to improve their ability to identify and head off potential non-technical causes of such accidents. Can the Navy learn from these techniques for identifying and mitigating human causes of diving accidents?

Although Navy diving is remarkably safe, accidents and mishaps do occur because of the high-risk environment in which the Divers work. The U.S. Navy diving community is adept at identifying and mitigating technical problems. However, as in other industries, the Navy is not as adept in dealing with the non-technical causes of accidents.

NAVSEA Deep Submergence Biomedical Development has funded NEDU to provide a better understanding of the non-technical skills required for safe and effective diving operations and learn how to use this knowledge to improve both safety and productivity. Borrowed from other industries, the techniques to be used are specifically tailored for military diving. Currently we are one year into the three-year project and have been examining diving mishap reports, interviewing Divers, and collecting questionnaire responses. Although these data are still being collected, it is possible to draw conclusions from the information gathered to date.

Our analysis of dive mishap reports shows that the causes of the majority (70%) of the mishaps were classified as

unknown; human factors accounted for 23% of the mishaps. Five reports of fatal diving mishaps were also examined. The most common causes identified from the reports include poor leadership, poor situation awareness (particularly environmental awareness and anticipation), poor risk and time assessment, and lack of personal resources (coping with stress and fatigue).



Air Florida Flight 90.

When we interview Divers about accidents or near misses in which they have been involved, our preliminary results show that they identify failures in situation awareness, communications, decision making, and leadership as causal.

Responses to our attitude questionnaire show that 1st Class Divers are more likely to deny that personal limitations affect their performance than 2nd Class Divers. Furthermore, 1st Class Divers have a significantly higher belief in the authority of senior team members than 2nd Class Divers and Diving Officers. We also asked respondents to list what they believe to be the three main causes of diving accidents. "Complacency" was the most commonly identified cause, followed by "fatigue" and "training."

Although data collection is not complete, it seems to indicate that the training of 1st Class Divers or Diving Supervisors as well as of Diving Officers could benefit from incorporating instruction in diving-specific leadership, developing and maintaining situational awareness, and assessing how risk, time, and personal limitations affect performance.

LT Paul O'Connor is a Research Psychologist at NEDU.

"Papa Topside", Captain George F. Bond, MC, USN

By: Dr. John Murray

Dr. George Bond, "Papa Topside", as he was affectionately known to the aquanauts of the SEALAB program, was the Senior Medical Officer and principal investigator for SEALAB I, II, and III. His work on behalf of deep saturation diving and undersea medicine earned him recognition as the "Father of Saturation Diving." In the mid-1950's, then CDR George Bond, Director of the Submarine Medical Center (SMC) at the Naval Submarine Base, New London, CT, was credited with the key insight upon which saturation diving is based. As author Sylvia Earle recounts, "Bond pointed out that once a Diver's body was saturated with compressed gas – when tissues had absorbed all they could and equilibrium was reached – the decompression time would be the same whether the Diver stayed underwater for a matter of hours, days, weeks, or even months. The amount of time necessary for decompression depends on the depth of the dive and on the gases breathed."



SEALAB I being placed in the water off Panama City, FL.

At the SMC, or the Submarine Medical Research Laboratory as it would later be called, Dr. Bond was responsible for research on submarine escape. On the side, he began work on Project GENESIS. "GENESIS" was the code name given to the first studies of the effects of saturation diving on man. The project consisted of phases, with the initial A and B phases during 1957 and 1958, concerned with exposing laboratory animals to saturation in various breathing gases. With the animal work completed, Dr. Bond proposed to extend the study to man and

"offer the opportunity for development of ecological systems which would permit man, as a free agent, to live and perform useful work to depths at 600 feet, and for periods in excess of 30 days." His proposal was rejected.

After first failing to obtain funding for human experiments, the space program's interest in helium-oxygen atmosphere for manned space flights finally broke the money loose for human saturation diving experiments. Phase C, in late 1962, exposed three subjects to a 79% helium - 21% oxygen atmosphere at one atmosphere for six days. The effect of helium on speech was noted, but the men experienced no ill effects. Naturally, then Chief Quartermaster Robert A. Barth was one of the Divers.

Phase D took place at the Navy Experimental Diving Unit (NEDU) in 1963. Barth was again an experimental subject. The saturation dive in the NEDU chamber was in a 62% helium, 32% nitrogen, 6% oxygen atmosphere with the complex pressurized to 100 feet of sea water (fsw). The Divers were able to make "excursions" into the attached "wet" room and simulate work on the bottom. The final GENESIS experiment, Phase E, took place later in 1963 at the Naval Submarine Medical Laboratory in the Climate – Altitude Chamber. The depth was 200 fsw and the dive lasted 12 days. The breathing mixture was 79.5% helium, 16% nitrogen, and 3.5% oxygen. Once more, Barth volunteered. The successful conclusion to Phase E of Project GENESIS completed the laboratory work for the U.S. Navy's Man in the Sea program.

SEALAB I was the Navy's first open sea, manned underwater experiment. The four aquanauts, including (you guessed it!) Bob Barth, would live in the cigar-shaped chamber, 40 feet long and 10 feet in



Captain Bond, 1915-1983.

diameter, with two portholes on each side and two manholes in the bottom. Water did not enter because pressure in the chamber was the same as the surrounding water. The aquanauts wore the Navy's standard Mark VI semi-closed breathing apparatus while outside working or exploring. They could also breathe off a hookah system via an umbilical.

The initial test was carried out in the Gulf of Mexico near Panama City, Florida at a depth of 193 fsw. A Submersible Decompression Chamber (SDC) served as the elevator from the surface down to SEALAB I, which was supported on the surface by a support ship, the large lighter, YFNB-12. Cables carried electricity, compressed gas, fresh water, communications, and atmosphere sampling lines between the underwater habitat and the surface. Dr. Bond and Captain Walter Mazzone gave the habitat a final inspection, and on July 20, 1964, the aquanauts entered the habitat and the experiment began. The early start to hurricane season caused the dive to be

ended after eleven days, but SEALAB I was a major success. Many lessons learned would be applied to subsequent saturation dives such as better engineered solutions for raising and lowering the habitat, lower humidity, helium speech unscrambling and better communications, improved umbilicals, swimmer navigation equipment, and reducing the gear the swimmer had to wear, don, doff, and store in the habitat. Through it all “Papa Topside” was topside!

SEALAB II moved the operation to a site off La Jolla, California. The new and improved SEALAB II was 57 feet long and 12 feet in diameter, with a small “conning tower”, that made it resemble a railroad tank car, without the wheels. Many improvements had been made. A more adequate support ship was also added, a staging vessel used in the POLARIS missile testing program. The refitted support ship, renamed the BERKONE, had a Deck Decompression



SEALAB III towed alongside USS ELK RIVER prior to submerging to 610 feet off San Clemente Island.

Chamber (DDC) installed, and a Pressurized Transfer Capsule (PTC), which transported the aquanauts from the surface to the habitat, and could be mated to the DDC for Transfer Under Pressure (TUP) and continuous decompression aboard the surface support ship.

Three teams of 10 men (a total of 28 aquanauts because two men would be on two teams) would each spend 15 days on the bottom in 205 fsw. On August 28, 1965, 10 aquanauts swam down to the habitat. The gas mixture was 77-78% helium, 18% nitrogen, and 3-5% oxygen. Astronaut Scott Carpenter was leader of Teams 1 and 2. Bob Barth kept his record



Ocean Simulation Facility plaque.

intact and was one of the 28 aquanauts. The cold water off the coast of California was a real test. Visibility was poor. High humidity continued to make living conditions uncomfortable. But the aquanauts handle adversity and conducted a multitude of physiological experiments and tasks. Dr. Bond presided over the highly successful experiment.

SEALAB III was conducted off San Clemente Island, California in 1969. ELK RIVER (IX 501), a World War II landing ship, was converted to provide support for the diving operations. SEALAB III was the same habitat used in SEALAB II but modified with the addition of two rooms to the bottom of the habitat. One room would serve as a diving station and the other for storage. The habitat was placed on the bottom in 610 fsw. Five or six teams of eight Navy and civilian aquanauts were planned. The atmosphere was 95% helium, 3.5% nitrogen, and 1.5% oxygen. The experiment was planned to last 60 days. Now Chief Warrant Officer Bob Barth was chosen to be a team leader. Before the first team entered the habitat, a helium leak occurred. A four man team, including Bob Barth, went down in the bell to fix the leak, and one of the four, Barry Cannon, suffered a malfunction of his diving gear and died. This ended SEALAB III, which was raised and the project shelved. The Navy’s interest in saturation

diving now shifted to DDCs and PTCs from the deck of a ship in support of submarine rescue.

George Bond received his B.A. and M.A. from the University of Florida and his Medical Degree from McGill University School of Medicine in 1945. Following his internship at Memorial Hospital in Charlotte, North Carolina, Dr. Bond established a general practice in rural Bat Cave, North Carolina. He was the sole medical provider for 6,000 people in a 400 square mile mountainous area. In 1953, Dr. Bond entered the Navy, and became a qualified Diving Medical Officer and Submarine Medical Officer. He was assigned to the Submarine Medical Center, and the rest is history! The Navy Experimental Diving Unit dedicated the Ocean Simulation Facility, certified man-rated to a depth of 2,250 fsw, in honor of Dr. George Bond in 1974.

Bob Barth was there.

Captain (Dr.) John Murray is the Program Manager of the Deep Submergence Biomedical Development Program at NAVSEA 00C.

The Historical Diving Society USA



The Historical Diving Society USA is a non-profit educational corporation formed in 1992. It has members in 37 countries and publishes the award-winning quarterly magazine HISTORICAL DIVER, which covers many aspects of diving history, including the U.S. Navy.

Among Society Advisory Board members are distinguished Divers such as Dr. Christian Lambertsen, Bob Barth, Scott Carpenter, Surgeon Vice Admiral Sir John Rawlins, Bev Morgan, Phil Nuytten, and Andreas Rechnitzer.

For more information on how to join the Historical Diving Society, please contact hds@hds.org.

One Navy Diver's "Most Excellent" Adventure

...As told to Jim Bladh & MDV Pete Ruden

Bob Barth recently retired from the Navy Experimental Diving Unit. Many of you are familiar with Bob's previously documented diving exploits. Captain Mark Helmkamp, SUPDIVE, having heard many sea stories from Bob regarding his life in and around diving, felt that readers of FACEPLATE would be interested in the story of Bob's life with some added stories of his diving career.

The Early Years

Bob was born and raised in the Philippines. Spending a few years living in far away places describes his life before joining the Navy in 1947. His father was a U.S. Army officer stationed in the Philippines and China when Bob arrived in the Barth household in 1930. Bob spent the first 11 years of his life in and around Manila with a short tour in Shanghai. (Bob's education really did start in Olongapo).

Shortly before 7 December 1941 most of the kids in Manila were evacuated to the mainland to get away from the pending war with Japan. Bob's parents were divorced and Bob lived with his mother in Manila. Bob's mother was interned for 3 years in a Japanese prison camp, returned to the USA afterwards, got married, and eventually the family found themselves in Durban, South Africa. Bob's mother and stepfather had been in prison camp together.

Life in South Africa for a 16-year-old boy was far from ideal. Once again Bob found himself in a distant city that lacked the companionship of other American kids. He became obsessed with rejoining the American scene, but since he could not leave South Africa by himself until he was 17 (which was less than a year away), Bob began to plot his departure.

Durban is a big seaport. Bob's family had arrived there by ship and there were ships leaving every week that would eventually get back to the USA. The chances of getting his folks to buy the ticket were nil and there was nothing Bob could do but wait until he turned 17.



Bob Barth during SEALAB III.

On 28 August 1947 Bob was now old enough to get his own departure visa. He went down to the waterfront, looked for merchant ships flying the American flag, climbed the gangway, asked to see the Captain, and then asked if there was something he could do to work his way home. A Lykes Line C2 called the "Wesward Ho" out of New Orleans was in port and needed an Ordinary Seaman. The necessary telegrams were sent, the American consulate in Durban was stroked, all the bases were touched, and finally Bob was told just before the ship's departure that he could work his way back home. The only remaining problem was to break the news to his family. You don't want to hear about that night at the dinner table when Bob told them that he was leaving. His mother's dream of Bob going to college was shattered (he might have well become a notable engineer and ended up an ED).

Arriving in Baltimore a couple of months later, Bob hopped on a train, went to Chicago, and joined the U.S. Navy. His dream of becoming a Navy Diver was close.

In the Navy

Following Navy boot camp and the subsequent assignments, Bob found himself aboard the aircraft carrier USS BOXER (CV 21). It did not look like he had much chance of becoming a Diver

aboard a bird farm, but his luck changed and at the ripe age of 18 Bob attended 2nd Class Dive School in Pearl. He was on his way.

Bob's first day of Diver training caused him to wonder if this vision of being a Navy Diver was a wise one. Jumping off the fantail of an ASR in a deep sea rig to test his claustic tendencies shattered the glorious image. But school was soon over and now Bob proudly wore a diving helmet on his sleeve that had a "2" in it but he was still a crew member on an aircraft carrier. It would take time before Bob got into diving full time.

As the years went by, Bob attended the Under-water Swimmers School in Key West and 2nd Class Dive School again at DSDS Washington. In January 1960 Bob reported for duty at the Escape Training Tank in Groton for a normal tour of shore duty. It was the beginning of eleven years of working with the some of the finest men Bob has ever met.

GENESIS

Bob first met Dr. George Bond in Key West a couple of years earlier when George Bond and Cyril Tuckfield made their record bouyant ascent from the submarine Archerfish. Dr. Bond was now one of the doctors in attendance at the tank during daily training. Dr. Bond had a vision.



1st Class Dive School graduation, 13 May 1966. (Back-L-R) Hedgepeth, Forrest, Barth, Tuckfield, Bent, Festag. (Front) Koesterman, Skiba, Blackburn.

Dr. Bond had met Captain Cousteau in 1957 and this meeting turned into a long and productive friendship. Cousteau had a program in the Mediterranean called Conshelf. Conshelf was a series of underwater habitats that were stationed at various levels in the sea. Cousteau felt that Bond's knowledge of diving medicine was necessary to answer some physiological questions Cousteau had encountered. Dr. Bond had the ability with his laboratory in Groton to help solve these unknowns. This is how the collaboration between Cousteau and Dr. Bond began and was to go on for many years. The early years of testing the concept were called Project GENESIS.

Project GENESIS took place from 1957 through 1963. From 1957 until around the middle of 1962 most of the studies were conducted at the Submarine Medical Center where Dr. Bond was Assistant Officer in Charge and eventually Officer in Charge. CDR Bond and his sidekick CDR Walt Mazzone were two of the several medical folks who came



Walt Mazzone.

down to the tank for the daily water work and were to become the two major movers and shakers for the SEALAB effort, which followed GENESIS. Early studies of the effects of saturation diving had been limited to laboratory animals (goats) but not humans.

In a seldom used room at the tank was a seldom used chamber. This chamber was a bit bigger than most of the chambers in those days. The final GENESIS dive with animals was conducted in that chamber. Dr. Bond borrowed the goats and as an interested party Bob was one of the goat handlers. This last dive was to a depth of 100 to 200 feet and lasted in the neighborhood of a week or two. With the successful completion of the animal phase of Project GENESIS, Dr. Bond went to the Navy and convinced them that GENESIS had proven his theory and requested permission to shift the testing to humans.



Dr. George Bond.

Dr. George Bond had a convincing manner. In November 1962 the team found itself at NMRI Bethesda. There was a rickety old chamber in the basement of one of the buildings and they commenced to make it ready for the first planned saturation dive for the U.S. Navy. The crew consisted of two Navy doctors and one Chief Quartermaster. With the unknowns not clear – what pressure and helium would do to a human during long exposures – the decision was to fill the chamber completely with helium and the required oxygen, but not putting any pressure in it. If the Divers encountered some unknown physiological problem brought on by a lengthy stay in helium, they could just open the door and walk out with no decompression required.

After a week in the chamber, the Divers walked out smelling like the goats from the previous dive. A noticeable increase was evident in the vocabulary of the two Navy doctors – Bob had held school.

The next of the three dives was scheduled for spring of 1963 at NEDU, then located in the same building as DSDS at the Washington Navy Yard. The three-man crew consisting of same Chief Quartermaster and two Chief Hospital Corpsmen. No problems were encountered and the dive was completed successfully at 100 feet lasting about two weeks.

Proud of the success, the last and final GENESIS dive was planned back at the Submarine Medical Center in a brand new chamber that is still there today. This final dive was scheduled for the length of a couple of weeks at a depth of 200 feet. The team was chosen to be the Doctor from the first dive, a Corpsman from the second, and again, the Chief Quartermaster. As in all previous dives, it was one test after another. Doctors from all over were there getting their bit of flesh, body fluids, or red blood, but it was soon over. The men surfaced without any problems at all, patted themselves on the back, and set out to figure out how they were going to get men on the bottom of the ocean. The Cousteau concept of underwater habitat seemed like a good idea.

SEALAB

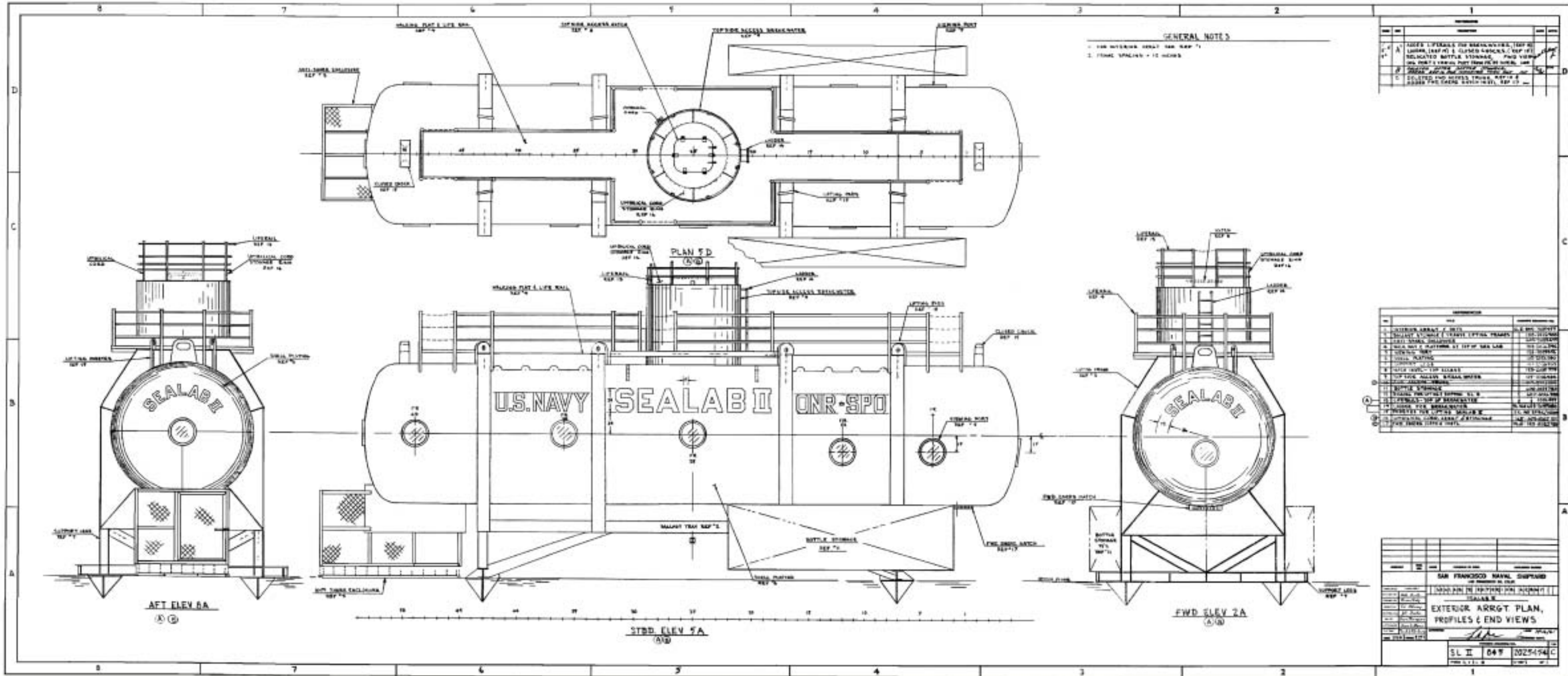
At the completion of the GENESIS program, Dr. Bond and Walt Mazzone had proof that the saturation concept was a safe and new style of diving. Now it was necessary to prove it at sea. In late 1963 there was nothing in the Navy inventory to enable Divers to conduct saturation dives in deep water. The Cousteau group had their equipment in the Med with their Conshelf program but nothing in the USA. GENESIS had helped Cousteau but the U.S. Navy had no equipment to use.

(One Navy Diver's "Excellent Adventure ...continued on page 14.)



Bob Barth in interview with Walter Cronkite at San Francisco Naval Shipyard in 1968. Habitat in background.

U.S. NAVY SEALAB II



(One Navy Diver's "Excellent" Adventure....continued from page 11.)



(L-R): QMC Bob Barth, HMC Glen Iley, SWC Howard Buckner and LT Dan Smith prepare for a dive during SEALAB II. Courtesy of Museum of Man-in-the-Sea.

The Cousteau method of a habitat was accepted, but where would the group get a habitat? Some great minds got together and decided to build the habitat. The small Navy base in Panama City had some old floats that might do the trick. Bob had been transferred from the tank back to sea duty in Key West and happened to be home visiting his folks in a small town just 60 miles east of Panama City. Dr. Bond asked Bob if he could come over and the two of them would decide if they could make a house out of what was available.

On 5 December 1963 they showed up at the Navy base, were taken to the junk yard, and shown the two large floats. It was a tough question since no one in their group had ever seen a habitat and surely never made one.

The engineers' enthusiasm to work on this project was written all over their faces. Little did they know then that the group at this small base were going to become major contributors to everything the Navy did in deep sea diving for the next 40 years.

After a couple of hours of discussions as to what these large cylinders would look like as a house on the seabed, the agreement was made – working together,

Divers and engineers would build SEALAB I. It would take many pages to give you a good description of what took place in the building of SEALAB I, but there is just not time for it in this article. There was a great deal of cooperation in the making of this unique habitat among all parties involved.

With the habitat completed, SEALAB I was taken to sea just off Panama City. In an attempt to get her on the bottom, she was dropped and flooded, and the habitat was brought back to the base for refurbishment. Eventually the habitat ended up in Bermuda and the habitat was prepared to be towed to its intended bottom location. In the final test the habitat was dropped again and brought back to Bermuda for cleaning. It was finally determined where lowering mistakes were being made and the following attempt to put SEALAB on the bottom was successful.

The four-man crew was assembled and descended down 193 feet to commence the 11-day stay. The duration of the SEALAB I dive had been planned for longer than that but it was the hurricane season of 1964 and sure enough there was one heading towards Panama City. The planned two day decompression was scheduled to occur by raising SEALAB to the surface at decompression speed. With the storm on its way and the seas too rough to maintain a proper decompression rate, alternate methods of decompressing in an old single lock recompression chamber that they had made into what was called a Submerged Decompression Chamber had to be utilized. Four men crammed into the small chamber for the final day of decompression. A day later the group emerged from the SDC tired, but happy because the idea worked.

All of a sudden there was enthusiasm throughout the Navy diving community. Saturation diving seemed to be a viable method that was slowly being accepted by those that thought it was impossible. Orders were written,

transfers started taking place, and for the first time it all came together as a bona fide, card carrying organization with sights set on building a new and bigger habitat that was to be called SEALAB II.

San Francisco's Hunters Point Naval Shipyard was the selected builder of SEALAB II. An additional contract was let to build the Navy's first sat system, a real DDC and PTC were going to serve the users of the new SEALAB.

It took a while to do all the building and to get it all together in one location, but on 28 August 1965 everything was located about a mile offshore La Jolla, California. The habitat was sitting in 205 feet of water and the first crew went down to spend 15 days on the bottom. A total of 28 men spent 15 days on the bottom with two men doing 30 days. There were three teams of Divers from all across the country. SEALAB II was another success with one minor bends case.



SEALAB II prior to christening in 1965 at Long Beach Naval Shipyard.

When it was all over, they had done it and the skeptic population was dwindling. SEALAB III was planned to be in 600 feet of water. But that is another chapter and this one is about to close.

Jim Bladh participated in support of SEALAB I and II. He retired after 30 years of active duty and 28 years of civil service at NAVSEA 00C.

Pete Ruden was a Navy Diver for 19 of his 22-year Navy career. He was assigned to the Man-in-the-Sea Program and CSDG 1 as a Saturation Diver, Saturation Master Diver, and Saturation Diving Officer for much of his career.

Deep Kim Chi

My experience with "Martini's Law"

By: Scott Carpenter

The first 15 years of my Navy career were devoted to airplanes and aviation, which amounted to the dream of my lifetime. My flying duties involved nearly every type of airplane the Navy had and even included a Mercury spacecraft. My duty stations took me to nearly all of the Navy's Pacific Island installations, which amounted to the realization of another lifelong dream.

The years spent in the Pacific created a fascination for the deep ocean, the coral reef, and undersea life in general. Spear fishing and SCUBA diving, which combined the thrill of the hunt and the ability to stay for prolonged periods in otherwise forbidden territory, were powerful incentives for me to learn more about this mysterious world. Notable among other inspirations for me were the many films, books, and exploits by the famous French oceanographer, Jacques-Yves Cousteau. I was hooked.

In my desire to become a part of that world, I realized that my experience in aviation and space flight technology might have some additional value in its transfer to manned underwater living. I spoke with Captain Cousteau about working with him. He agreed that there might be some value in that transfer of technology and suggested I speak with the U. S. Navy. Enter Captain George Bond ("Papa Topside"), and another fabulous adventure for me.

My training started originally with the four-man SEALAB I crew of aquanauts and their support Divers with whom I worked for a number of years. Notable among those vastly experienced Divers was the now famous Bob Barth, who since has become the dean of all Navy Saturation Divers.

As an outlander, and with very little diving experience, I became...I must say with pleasure... the team flunky and gofer. I learned much at the hands of those men during those times, and was treated gently, for the most part; but I didn't escape being the butt of many tricks and jokes that often went over my head.

Throughout all of the education I got at the hands of that crew, the cool, patient, experienced Chief Quartermaster Bob Barth held sway, and I came to have an overwhelming respect and admiration for that man. There was nothing I wouldn't have done for him, and that continues to this day.



Scott Carpenter and Bob Barth preparing to go outside SEALAB II.

One episode is illustrative and I'll never forget it. We had a number of civilian team members from Scripps Institution and other non-military organizations. One was a fine underwater photographer named Bill Bunton, who was at about 215 feet with another Diver (we were using semi-closed circuit, helium supplied MK VI gear). His buddy had difficulty with his breathing rig and would probably have to surface without decompression.

Bill dropped his huge \$25,000 camera on the bottom and helped his buddy back up to the surface. They made it to the chamber ashore and no one got bent, but there we were... no Divers with enough bottom time left to go get the camera, and it was getting late in the afternoon. Bob and I got the job.

As a unique and largely unregulated arm of the Navy Diving capability, and under the command of the maverick George Bond, we were able to undertake diving tasks, times, and depths denied all other Divers in the Navy. This was where I wanted to be, especially if I had the company of Bob Barth.

We found the descending line the other two Divers had used and went down to find the camera. Wanting to show that I was emerging from my neophyte status, I went down fast. Bob took his time. Somewhere around 200 feet I spotted the camera, left the descending line, and took off for the camera at high speed. Bob took his time and watched. I picked up the camera and swam rapidly and victoriously back with my prize.

During what I remember as a very sedate ascent, we reached what I think was a 30 foot stop, and he signaled that there we should wait. I was glad to do that because I was so happy with the success of our recovery operation. In fact I was pretty happy with about everything that was going on at that time. I remember discovering that decompressing upside down on the line, where I could watch the surface, was more fun than decompressing right-side-up, the way Bob and other Divers did. Again, Bob let me be, and we went back up to the surface.

I think we did some precautionary decompressing in the chamber afterward but I am not certain. Those were busy times and a long time ago. We haven't discussed the event much, but I remember more of what I learned from what happened than of what actually happened during those days. One enduring lesson has been that one can be a wise old man of the sea even though he is a young man.

I owe that young man a lot.



Scott Carpenter is the world's first Astronaut/Aquanaut. He was Team Leader during SEALAB II in 1965. In 1967 Carpenter returned to the Navy's Deep Submergence Systems Project as Director of Aquanaut Operations during SEALAB III. He was also one of the original seven astronauts for the Mercury project in 1959.



Navy Divers Find a New Dive Buddy

By: HTC (DSW/SW) Glenn Rubin

In the late 1950's and early 1960's Captain George Bond used Navy Divers in the GENESIS laboratory experiments, which set out to prove saturation diving was possible and could dramatically improve the depth, duration, and productivity of working Divers. In order to advance his research and prove its practicality, the Navy conducted SEALAB I (1964), II (1965), and III (1969). The successes and failures of these early deep diving pioneers are now part of Navy deep sea history. However, the foundation was laid for future programs whose goals are to enable humans to live and work under the sea.

Over the past four decades, many underwater research habitats have come and gone. The latest and only remaining research habitat is the National Oceanographic Atmospheric Administration's Aquarius. Aquarius is an 85-ton, double lock chamber that is secured to a 120-ton baseplate, 3.5 miles offshore near Key Largo, Florida.

Aquarius is operated by the University of North Carolina at Wilmington's (UNCW) NOAA Undersea



NOAA's habitat "Aquarius", a.k.a. the George F. Bond, located within the Florida Keys National Marine Sanctuary at Conch Reef. Aquarius is used by scientists to study near shore ecosystems.

Research Center (NURC). The primary function of Aquarius is to support underwater research to better understand our oceans and coastal resources. The base of operations is in Key Largo – just a stone's throw down the pier from Dick Rutkowski's Hyperbaric Medicine School.

From April through December the NURC staff supports 10 saturation missions lasting 10 days each. With unlimited bottom time and a well-equipped research lab located on the reef, Aquarius marine biologists are making significant discoveries about our planet's coral reefs and oceans.

Divers participate in the monthly saturation diving missions, which would allow for a sharing of ideas and information between the research and military diving communities. In other words, it is helping us to get out there to see how the rest of the world lives. By its very nature, military diving often tends to insulate us from the rest of the world's working Divers.

What I Did On My Summer Vacation

This summer DC1 (DV) J.R. Hott and I went TAD from NEDU to Key Largo to support the August Aquarius

mission. When I received word that I was going, I eagerly logged onto the Aquarius website to educate myself. The website was very informative, but what was this? We were going to support a group of marine biologists studying "sponge production and recycling of new nitrogen in coral reefs." I am a hairy-knuckled diving Hull Tech and firmly embrace the *bigger hammer more better* mentality. What kind of help could I be to these sponge scientists?

The Aquarius TAD turned out to be more interesting and educational than I had imagined. I was impressed by the NURC staff. They are a small group of men and women with quite diverse diving backgrounds: commercial, recreational instructors, Army and Navy officer and enlisted, DOT, and NOAA researchers. But their diversity is their number one strength. They are a cohesive team assigned to the awesome task of caretaker for a valuable national asset. The NURC staff is responsible for the safety and well being of the visiting teams of scientists as well as maintenance and repair of Aquarius, its support systems, equipment, and craft. Their crew, facilities, and budget may be small, but they do it all.

Striking Up A Partnership

In early 2003, an idea was hatched by SUPDIVE Captain Mark Helmkamp, NOAA's Captain Craig McLean, NEDU's Bob Barth (GENESIS, SEALAB I, II, III), and Aquarius's Operations Director Craig Cooper to form a partnership that would let Navy



NEDU's DC1(DV) J.R. Hott and Aquarius Operations Director Craig Cooper visit the "Kamper" Way Station.



Aquarius's Billy Cooksie (HTC (DV) retired) and Ross Hein leaving "Kamper" Way Station.

The Mission

For the first two days of the saturation mission, J.R. and I helped with daily boat runs offshore to resupply the Aquanauts. Gear and supplies were packed into large industrial pressure pots that painters use, and we humped these up and down to the Aquarius's wet porch that sits at 49 fsw.

The trip got interesting when on day 3 with Hurricane Charlie 48 hours from striking the Florida Keys, the decision to terminate the mission was made. We immediately commenced the 16-hour saturation decompression to bring the Aquanauts to safety. Of course, Aquarius would have to ride out the storm on the bottom, so we set to work battening down the hatches...arrrrrh!



Aquanauts make pit stop at gazebo way station to charge SCUBA.

First, we recovered the 1,000-foot long SCUBA charging hoses and charging stations that spider outward from Aquarius to three Diver way stations. The way stations (diving bells) were flooded to keep them from traveling in high seas. A fourth way station was hoisted aboard the support craft Sabina and brought ashore. Once the Aquanauts surfaced, teams of

Divers began securing and disconnecting habitat's power, coms, and air supply. Aquarius receives these utilities via a 4-inch diameter umbilical from the 30-foot diameter discus shaped Life Support Buoy (LSB) moored above her.

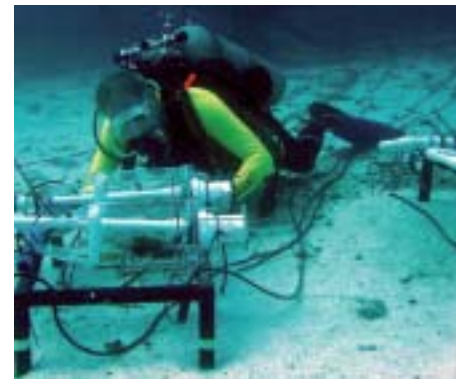
My first opportunity to tour inside the habitat came when my dive buddy and I were sent inside to perform shut-down procedures. My first impression was: utilitarian, but comfortable. Most impressive though was the view of the reef from the two 30-inch diameter view ports – enchanting is the word. The final task was to haul the umbilical aboard the LSB and secure it.

Two days later, after Charlie edged past Key West and traveled north, we returned to Aquarius to inspect for damage and, luckily, found none. Once it was clear that the other hurricanes forming in the Atlantic were not a threat, we redeployed some of the gear and services we had secured days before.

A Reef Hugger Is Born

During the 10 days that I worked and lived with the NURC staff and scientists, I came away with a profound respect for the work they do. I was amazed by the level of passion the more seasoned marine biologists had for their work and was equally amazed to meet so many young college kids with the same passion. We owe a debt of gratitude to them for their work. In spite of the overwhelming forces that threaten our planet's oceans, these

folks care and want to make a difference and fight on. As a self-described "tree hugger", I can now call myself a "reef hugger", also.



Aquanaut inspects test set up measuring coral respiration.

An Exciting Future

Since the mid 1990's, Navy Divers attending Saturation Diving School have not conducted an actual sat dive as part of their training. Currently the students attend three weeks of classroom training at NDSTC and eventually make a sat dive at their current or follow-on command.

That is all about to change. Aquarius's Craig Cooper and SUPDIVE Captain Helmkamp have coordinated a plan that will allow Sat School graduates to venture down to Aquarius in December for a four-day sat dive.... ahhhhhhh...72 degree water, beautiful coral reefs, 90 foot visibility, dehydrated meals by the view port and key lime pie for dessert! Navy Divers have never had it this good!

The Aquarius/Navy partnership holds great promise for fostering a cooperative exchange of effort and education that will benefit both of us a great deal. If given the chance, I highly recommend that you get down to Key Largo and meet your new dive buddies.

Check out these websites for more information about NOAA's Aquarius: www.noaa.gov and www.uncw.edu/aquarius.

HTC (DSW/SW) Glen Rubin is Unmanned Testing and Evaluation Division Officer at NEDU.

As required by OPNAVINST 3150.27A, all diving systems used in the U.S. Navy must be certified as being safe for manned use. In order to comply with the requirement to ensure safe diving systems are in operation throughout the Fleet, all of these systems go through a System Certification Survey once every three years.

At the request of Captain Wilkins, the Supervisor of Salvage and Diving, we in the System Certification Authority office have reviewed all of our survey findings to see if there were common deficiencies found throughout the Fleet. In the past, these deficiencies have been addressed on an individual basis within a single command during the certification surveys. Addressing these deficiencies at the command level does not afford the opportunity for other diving commands to gain knowledge from survey findings. To this end, our office has compiled the following Top Ten discrepancies encountered during System Certification surveys. From time to time we will update this list so that all of the diving commands can have the advantage of learning from the experience of others.

Top 10 Hits

1.) Master Divers not involved in the certification survey.

Certification is delegated to levels that do not support the critical nature of system certification. We have visited commands where the Master Diver was not present until the final debrief. While this is not an actual finding on a Cert Card, the absence of MDV involvement often results in Cert Card findings in other areas.

2.) Commands are not using the System Certification Requirements / Guideline Checklist.

The checklist is posted on the 00C website (www.supsalv.org) for the use by commands that are about to undergo a Certification Survey. The Checklist and PSOB should always be used when preparing for a certification visit.

3.) Commands are sending diving systems out to contractors without initiating a REC for the work to be accomplished.

This REC needs to include a scope of work which details what work the contractor is to accomplish, the OQE that the contractor must provide to show the work was properly accomplished, and the standards/requirements that the contractor must be follow when performing the work.

4.) Commands are not cleaning software.

There have been a number of instances where the brown O-ring bag is stapled to the REC (this is not necessary unless the bag is labeled as O₂ clean and is the OQE for cleanliness) yet the O-rings have not been cleaned. There is a simple detailed procedure in Topside Tech Note VI for cleaning software using NID.

5.) Commands are not suspending certification on their systems prior to major work or maintenance being performed.

For example, when Flasks are sent out to be hydrostatically tested, prior to work commencing on the system, commands must suspend certification either via letter or message to 00C4. Commands can suspend certification on their systems whenever necessary. However, only the SCA can reinstate certification.

6.) Commands are not using Test and Inspection Reports for documenting Pass/Fail and inspection results.

Commands must document visual inspection results on DLSS components such as Filters, Moisture Separators, Volume Tanks and HP Flasks by completing a Test and Inspection Report. The 00C website has two downloadable standard Test and Inspection Forms that are filled out with detailed inspection criteria, and only require the results to be filled in by the command.

7.) Commands have been using single REC packages to conduct maintenance on multiple systems.

The standardized Re-Entry Control Procedures allow for only one subsystem to be covered under one REC.

8.) The plastic TRCS console fascias are cracking and warping.

While a cracked or warped console does

not automatically cause a Cert Card to be generated, the deformed panels have caused cracks in pressure gage housings and faceplates. New Console fascia panels are available from the following sources: ESSM Cheatham Annex, Prime Vendor, or Cowan.

9.) Commands are not opening up the FADS III and LWDS consoles periodically to check for moisture and corrosion and verify relief valve settings are documented.

These consoles are not watertight. When the systems are operated and stored for a significant time out in the weather, they often have seawater inside the console case.

10.) Commands are still not maintaining pressure on the Purification Towers for HP air compressors.

When the pressure is bled off from these systems, moisture is allowed into the system and causes a rapid breakdown of the desiccant. This results in a highly caustic compound that gets blown into the system and rapidly corrodes through the thin aluminum liners of the composite flasks.

Online Re-Entry Control Forms

There are two new Re-Entry Control Forms available for download from the 00C4 section of the SUPSALV website. These forms are to be used for documenting the PMS required visual inspections on Divers Life Support system components. (See Top 10 Hit #6)

One form is specifically tailored for conducting visual inspections on the Air and Oxygen HP composite flasks. The other form has been customized for performing the visual inspections on DLSS Filter Housings, Purification Towers, Moisture Separators, and Volume Tanks.

New Online PSOB

The latest standardized PSOB to be posted on the 00C website is the standard PSOB for the FARCC. The online PSOBs are continually being updated so go to the website and save the latest revision when preparing the PSOB for certification.



Rapture OF THE DEEP

“Service to the Fleet”



This page is designed to give the readers the latest “Buzz” on various topics to USN diving and its systems.
Compiled and written by MDV Steve Smith (smithss@navsea.navy.mil)

Kinked Umbilical Casualty

On 23 September 2004, Mobile Diving and Salvage Unit Two (MDSU TWO) Divers were tasked with assisting SIMA Norfolk Dive Locker during the removal of USS HARRY S. TRUMAN (CVN 75) #1 propeller off the shaft taper. MDSU TWO Divers splashed to apply and initiate detonating cord (high explosives) to the forward end of #1 propeller hub. MDSU TWO Divers utilized MK 21 deployed from Charlie Team dive boat. While at depth on the project, Red Diver reported loss of air and immediately initiated EPs. Diving Supervisor asked Green Diver how he was breathing and Green Diver reported he was okay with no air supply problems, Console/Bank pressures were satisfactory. Red Diver reported that his air had been restored almost immediately after reporting the loss. The dive was aborted and both Divers returned safely to the surface. Once topside, the Divers were unhatted and it was immediately determined that Red Diver’s umbilical had kinked at the hat connection (non-return valve).

Root Cause: The root cause of umbilical failure at the hat connection was primarily due to the frequency of removing the MK 21 helmet without sufficient support of umbilical weight in conjunction with setting the helmet on faceplate.

Corrective Action: Inspect umbilical shackle points on dive benches to ensure there is sufficient support to relieve the strain experienced from umbilical weight and assume the practice of resting the MK 21 helmet on the neckdam area vice the faceplate. Routinely inspect umbilical end fittings during pre-dive setup.

Umbilical Information: JDR Aqualite Divers Air Hose HA0106. AMRON International, P/N: ADU3-MK21-MH-0-330. In Service Date: August 27, 2003.

Buoyancy Compensator and Hose Recall

The U.S. Consumer Product Safety Commission announced the following



MK 21 kinked umbilical.

recall in voluntary cooperation with the firm, Halcyon Manufacturing, of High Springs, Florida. Commands should stop using the Halcyon SCUBA Buoyancy Compensator (BC) Inflators immediately. The SCUBA BC bladder may have a slow leak because of imperfections within the machining of the stainless air barrel of their inflators. This can cause unexpected buoyancy problems with Divers, possibly resulting in decompression sickness. Halcyon is recalling all stainless steel Power Inflators. They have a stainless steel oral and power inflate button. Inflators made of plastic are not included in this recall. The repaired inflators have a groove at the base of their retainer nut. The BCs sold with these inflators are black and the Halcyon logo is on the front and collar of the BCs. For further information go to: <http://www.cpsc.gov/cpscpub/prerel/prhtml04/04209.html>.

Aqua Lung has received reports that some of the ribbed hoses on the Powerline Airway have been tearing at the top near the dual exhaust valve. The problem has been traced to an error in the molding process from their supplier that occurred over a three-month period between 2001 and 2002. The best way to confirm whether or not you have one of the questionable hoses is to look at the serial number on the lower unit of the Powerline. If the serial number falls within the range of M48H to

M52H (M48H, M49H...M52H), or M01I to M08I (M01I, M02I...M08I) and is the original hose, then it should get replaced. This affects both SeaQuest and Aqua Lung BCs utilizing the Powerline inflator.

Power Inflator Recall

Another consumer recall is on Pelagic Pressure Systems, of San Leandro, California, Power Inflators. The buttons can stick, which can cause uncontrolled inflation of the BC. The recall includes Oceanic-brand Reliant BC inflators and AERIS-brand AW3 BC inflators. The Oceanic Reliant-type inflators have three flow-through holes in the hand grip of the lower inflator mechanism. The AERIS AW3 inflator has one flow-through hole in the hand grip of the lower inflator mechanism. Authorized Oceanic dealers sold BCs fitted with Reliant inflators nationwide from February 2004 through June 2004. Authorized AERIS dealers sold BCs fitted with AW3 inflators from May 2004 through June 2004. For more information go to: <http://www.cpsc.gov/CPSC/PUB/PREREL/prhtml04/04210.html>.

Compressor Interstage Relief Valves

Surface Force Maintenance Effectiveness Review (SURFMER) has found that the relief valves and settings provided by the manufacturers of ANU compressors are appropriate and calibration of Interstage Relief Valves is no longer needed or required. PMS MIPs affected are all MIPs that have relief valve maintenance, this includes 5921/H-012 series MIP.

Navy Divers Website

The Navy Divers website is up and running. It can be found at: <http://navy.com/navydivers>. If you have any comments or suggestions for website, please let us know.

Hard Hat History

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

Captain (Dr.) Ed Thalmann

Ed Thalmann, M.D., Assistant Medical Director of Divers Alert Network, died on July 24, 2004 in Durham, NC. He was 59.

Dr. Thalmann, regarded as one of the world's foremost authorities on diving decompression, joined DAN in July 1995 as the organization's assistant medical director. He was the physician resource for DAN medics, consulting with dive medicine physicians. While at DAN, Dr. Thalmann worked on the Duke University Medical Center medical staff, the Duke Anesthesiology Department, and at the Center for Hyperbaric Medicine and Environmental Physiology. There, he participated in both patient care (dive accidents and clinical hyperbaric oxygen treatments) and in medical research programs.

Dr. Thalmann retired from the U.S. Navy in 1993 after 22 years. While in the Navy, he



Dr. Ed Thalmann.

helped develop operational procedures for diving, testing, and evaluation of diving life support equipment and medical research programs. Projects included the development of new diving decompression tables (surface-supplied and saturation), measuring the

performance of and writing specifications for Diver thermal protective equipment, studying the effects of underwater exercise on Diver performance, and improving underwater breathing apparatus design and testing.

While in the service, he spent a year as the Medical Officer aboard the nuclear submarine USS THOMAS JEFFERSON, and then was assigned to the Navy Experimental Diving Unit in Washington, DC and then Panama City, FL, where he was involved in decompression table development, treatment of decompression sickness, and formulating 100 percent oxygen exposure limits.

He spearheaded two major revisions to the Diving Medicine chapter of the U.S. Navy Diving Manual in 1985 and 1993.

Dr. Thalmann is survived by Brenda Thalmann, former wife, and daughters Amanda and Katherine.

Captain Walter "Scotty" Marshall

Captain Marshall was born on January 10, 1918 in Barry, South Wales. He immigrated to the United States in 1923 aboard the White Star Line's SS BALTIC with his parents and sister.

In 1941, Walter L. Marshall enlisted in the U.S. Navy and was commissioned as an Ensign in 1942. LT Marshall attended the U.S. Naval Training School (Salvage), pier 88 in New York, NY in 1944 and qualified as a Salvage Diver.

From 1944 to 1945, LT Marshall served as Aide to the Commanding Officer and Technical Advisor, Ship Salvage, Fire Fighting and Rescue Unit, Seventh Fleet and participated in salvage operations in Manila and Subic Bay

supporting WWII Pacific Operations. Commander Marshall served as Seventh Fleet Salvage Officer and Repair and Maintenance Officer in Sasebo, Japan from 1954 to 1955. He then served as Fleet Salvage Officer and Repair and Maintenance Officer at Pacific Fleet Service Force, Pearl Harbor. From 1959 to 1961, Commander Marshall served as Head, Technical Branch, Bureau of Ships, and concurrent SUPSALV.

"Scotty" was highly decorated and retired from the U.S. Navy with the rank of Captain in 1966. Captain Marshall passed away in January of 2003 in Riverside, CA of Alzheimer's disease.



Captain Walter L. Marshall.

Captain Anthony Esau

Retired U.S. Navy Captain Anthony Christopher Esau, 65, died on September 23, 2004, in the Hancock Medical Center. Tony graduated from the U.S. Naval Academy in 1961 and had a distinguished 30-year Naval career.

Highlights of his career include: assistant navigator on the USS BON HOMME RICHARD; submariner and polaris missile officer on the SSBN GEORGE WASHINGTON CARVER; CO of the Submarine Rescue Ships USS SUNBIRD and USS ORTOLAN; CO of



the Naval Safety Center at the Naval Operations Base in Norfolk; CO of the Naval School of Diving and Salvage; "Father" of the new Diving and Salvage Facility at Panama City; and CO of the Naval Oceanographic Research and Development Agency in Bay St. Louis, Miss. where he worked very closely with Dr. Folger Whicker, Ph.D. and Dr. Bill

Moseley, Ph.D. who became his dearest friends in retirement.

Tony was the Navy's expert on the deep submergence rescue vehicle and its employment in Inner Space. He was also a leading figure in the development of "mixed gas" SCUBA diving.

Tony is survived by daughter Laura Wilson and her husband and three children; daughter Catherine Callahan and her husband and two children; and brother Richard and his wife.

Originally printed in the Virginian-Pilot on Sunday, September 26, 2004.



Command in the Spotlight

Mobile Diving and Salvage Unit ONE Detachment 7

By: *LT Todd Ochsner*

Divers of Mobile Diving and Salvage Unit (MDSU) ONE Detachment 7, commanded by CDR “Bette” Bolivar Bush, were involved in the search and salvage of two aircraft in the murky waters of the Columbia River near Arlington, Oregon in August of 2004. Two United States Marine Corps F/A-18 fighter jets were involved in a mid-air collision on July 21 for which only one aviator of three survived. As the vast majority of the wreckage plummeted into the mile-wide Columbia River below, crash investigators requested MDSU ONE’s assistance in recovering the aircraft.

On August 1, MDSU ONE Det 7 flew to Whidbey Island, Washington from Hawaii aboard a Naval Air Logistics Office (NALO) DC-9. Det 7’s sixteen personnel later linked up with six Divers from Naval Undersea Warfare Center Keyport, as they too would be assisting in the salvage effort. Immediately upon arrival, the Divers loaded their gear and headed out on the six hour trek to the remote town of Arlington.

MDSU ONE and NUWC Divers employed a Lightweight Surface Supplied Diving System, with the MK 21, as well as SCUBA for their mission. Arriving late in the afternoon of August 3, Det 7 spent a few hours receiving a sobering recovery briefing from the On-scene Commander and then unpacked for the mission ahead. Coordinating with other military and civilian assets in the area, Det 7 underwent a marathon of nearly non-stop diving. Over the next ten days, Det 7 made 85 dives, coping with limited visibility and river currents, for a staggering total of 6,128 minutes or 4 days, 6 hours, and 8 minutes of bottom time.

Due to the expanse of the wreckage field, Side Scan Sonar and Remotely Operated Vehicles (ROV) were used to delineate dive-worthy objects of interest. When the Side Scan Sonar noted a viable

target, a ROV was sent down to inspect it. If the object was wreckage, Divers would be splashed to tag it for retrieval. Even with these gadgets on hand, some old-fashioned bottom searching had to be conducted. “This job was a great opportunity to use our Circle Line and Grid searching techniques,” notes GM1 (DSW) Chad Larson. “Because most of the searching was done on our small boats, we used SCUBA and tied our circle lines to anchors. It takes time to do a good search with SCUBA. Later on in the job though, we used the MK 21 off of a barge, which made the searches a lot easier.”

Large items, namely the fuselage of both aircraft, were marked with GPS and salvaged with a 100-ton crane. Interestingly, most of the aircraft wreckage recovered during this mission was pulled



A fuselage section of one of the destroyed F/A-18.

up by hand and did not require mechanical assistance to retrieve. In all, recovery efforts produced more than 95 percent of the total aircraft wreckage. All salvaged materials were subsequently reclaimed by the Marine Corps investigators for examination, identification, and inventory.

“I was amazed that the whole operation went so smoothly,” said GMC (DSW/SW) Joshua Dumke, Det 7 LCPO. “With so many different hands in the pot, Navy Divers, Marine investigators, civilian contractors and the like, I thought it would be more difficult. We were able to really keep focused just on completing our job at hand. It was a sweet job.”

Upon completion of diving operations on August 10, the Det 7 Divers loaded up once more and headed to Seattle for transport home via NALO.

MDSU ONE Det 7 exhibited the mobility and efficiency that is needed in modern day salvage operations. After traveling over three thousand miles by air and land to a remote dive location in Oregon, Det 7 successfully completed their job safely, efficiently, and expeditiously.

LT Ochsner is currently the DMO/PAO at MDSU ONE based out of Pearl Harbor, HI.





The Old Master



If you would have told me 30 years ago that I would be in the Navy today, I would have questioned your mentality. As they say, “Time flies when you’re having fun”, and I have had fun. It doesn’t seem that long ago that I left the corn fields of Iowa for the oceans of the world. My initial enlistment was for two years, yet here it is three decades later that I find myself nearing the end of my Navy career. I am proud of my achievements and consider myself fortunate to have served in the diving community. Our community is unique in many ways and the pride I feel is a result of those in it, past and present. That is the reason I “stayed.”

Our world continually changes, and the diving community has been no exception. Some of the changes I’ve witnessed within the diving community, such as: our icon, the MK V, has become display ornamentation; the MK 12 and open bell came and went; MK 1 band mask, Jack Browne, and double hose regulators were replaced with newer, better equipment; saturation and surface supplied mixed gas diving all but died and were reborn or are being reborn; and closed circuit re-breathers went from experimental to industry standard with variable PO₂ control. Most of these changes were equipment changes, a result of advancing technology and forward thinking by those in positions of authority to make change happen.

Diving Navy is changing more now than ever. Big Navy has introduced the five-vector model that enables Sailors to manage their personal and professional goals. This introduction presented unique obstacles for the diving community, since we employed various source ratings limited to a small number of commands.

Experience is another variable that influences change. It cannot be taught or learned, experience teaches us, and must be lived. It is a virtue of time; by merely existing you gain experience. Looking around the diving community today I see a vast amount of experience. People who have been there, done that, and have the T-shirt to prove it. Experience has no



A tired ENCM (MDV) Jim Carolan after a hard night's work.

substitute, and is often times the difference between life and death in our business. Experience has taught us to improve our equipment, our communities, and ourselves.

Meeting the requirements for advancement within big Navy’s model presented a problem within our community. So, we decided to do what we’ve talked about for years – make Navy Diver a source rating. This change is without doubt the biggest our community has ever seen because it influences our most vital asset – our people.

Our equipment continues to improve with technology, our training is second to none, and our people are

exceptional. The five-vector model is here, and it’s here to stay. With diving as a source rating, our community will take on a whole new look. Experience will play a vital role in advancement and achievement. There will be experience-based requirements for advancement as well as training. Individuals will have access to training resources, advancement requirements, and career management tools.

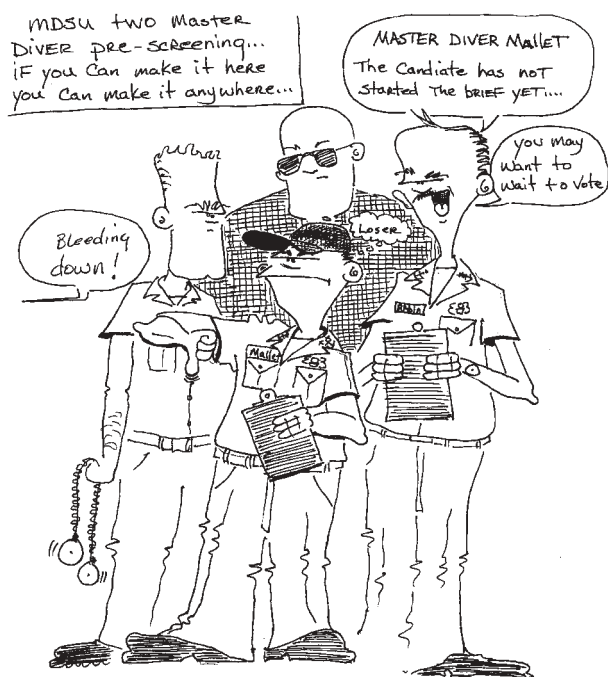
One thing that will not change is the people. Those hungry for additional responsibility and leadership positions will rise to the top. With Navy Diver as a source rating, every Diver should have a common goal – to be at the top. If you are not sure where that is, you have obviously chosen the wrong profession. Do not put yourself in a position in which you regret missed opportunity. I don’t regret what I’ve been doing. It has been an honor to serve with the finest the Navy has to offer.

I wish you all the best of luck and challenge each of you to look for opportunities in your life’s journey.

ALOHA!

JAKE’S CORNER

By: CWO4 Rick Armstrong





Topside; Red Diver...

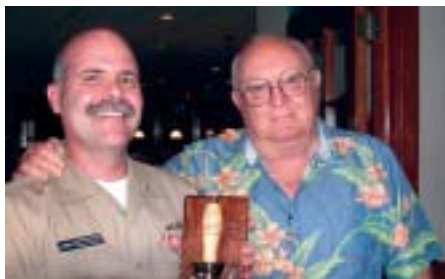
From the Supervisor of Diving

Captain Mark Helmkamp, USN

Saturation Diving

This issue of FACEPLATE is dedicated to both our history and future in saturation diving. I hope you enjoy familiarizing yourself with where we have been, where we are planning to go, and in particular, some of the stories of those individuals who dove before us. Indeed, we are members of a special fraternity and you can be very proud to have successfully met the challenges that are required to be a part of this exclusive team. For me (and I am sure many others) it is the people that are drawn to our diving community that I have met and associated with over the past 25 years that I appreciate the most. And while it is said that if you find a job you love, you'll never work another day of your life, a prime ingredient to successfully executing that philosophy is having opportunity to work with folks that maintain a great attitude. Bob Barth is one such person. The following story (of many – this one printable), as told by Don Crisk illustrates exactly why I love our Navy diving community and is why I am proud to have a friend like the SOB (Sweet Old Bob) discussed herein:

“Just around the times of SEALAB II, Wilber Eaton was assigned the task of taking a number of us out for training with the hand-held sonar/receiver (AN/PQS/18). So we loaded our gear aboard the dive boat and headed out to 50-60 feet of water. I don't remember all the other divers aboard, Shorty Lyons was one, Mike Meisky was another, and of course, QMC Barth. There were several others of course. Wilber laid out a rough square of buoyed targets, alternating pinger and sonar



I presented Bob an engraved MK V knife memento at a recent lucheon in his honor.

[targets]. Each leg was approximately 150 yards long. As expected, Bob was giving Wilber a hard time since Eaton was a GM1, but all went well for several runs until Barth refused to dive. Wilber then picked up what he thought was Bob's bottles, turned them on, and threw them over the side. Since those were the days of the old double hose regulators, they free-flowed. Wilber then told Barth to go get

them and make a PQS run while he was at it. Barth dove in, and soon we could see bubbles going around the course. Soon the [bubbles] were back at the boat, but Bob surfaced without any SCUBA on. He told Wilber that he couldn't find the bottles that he'd thrown over, but swam the course anyway. Wilber had to free dive to get the bottles. Good trick by Barth, and really typical.”

Want to learn more about the history of saturation diving and underwater habitats? Here's a short list of books I recommend:

- Bob Barth, *Sea Dwellers: The Humor, Drama and Tragedy of the U.S. Navy SeaLab Program*, Houston: Doyle Publishing, 2000.
- Helen Siiteeri, *Papa Topside: The SeaLab Chronicles of Capt. George F. Bond, USN*, Annapolis: Naval Institute Press, 1993.
- Dr. Joe MacInnis, *Breathing Underwater, The Quest to Live in the Sea*, Toronto: Penguin Group, 2004.
- James W. Miller & Ian G. Koblick, *Living and Working in the Sea*, Plymouth: Five Corners Publications, 1995.

The following book by Dan Lenihan is not about sat diving, but is a well written book about National Park Service divers that reveals early “tech diving” history:

- Daniel Lenihan, *Submerged, Adventures of America's Most Elite Underwater Archeology Team*, New York: New Market Press, 2002.

Fly-Away Sat System...An Update

Work continues on our Primary Objective: the fly-away sat system. This system is intended to be a minimum 600 fsw system, objectively designed for 1000 fsw use. It will be readily transportable by land or air to any appropriate Vessel of Opportunity (VOO) sea platform based on dimensional constraints of the ARS 50 Class. The system will consist of a double-lock deck decompression chamber with sanitary facilities, a diving bell, a bell handling system, and a control van.

The typical mission profile is one of mobilizing the system from the Navy Experimental Diving Unit, Panama City, Florida and personnel from Mobile Diving and Salvage Unit Two, Little Creek, Virginia to a VOO at the mobilization port, transit to the dive site, and take-up station keeping with dynamic positioning or mooring. Diving operations might consist of 21 days of diving to a maximum excursion to 727 fsw followed by 9 days of decompression, then transit to the demobilization port, where the system and personnel will return to their respective commands.

Most of my work on the system to date has been administrative and planning in nature, and on 21 December, the Top Level Requirements Document and Milestone A letter were signed. Having cleared these two monumental administrative hurdles, we are prepared to focus our energy on a more enjoyable aspect of the Saturation System (Sat-FADS): hardware. That is planned for FY 06.



Fly-Away Saturation Diving System (concept).

Next Generation Dive System...An Update

As discussed in the past two issues of FACEPLATE, development of the Next Generation Dive System (NGDS) continues – with gusto! NGDS for surface supplied air diving will enhance deployability, safety, and efficiency of U.S. Navy surface supplied air diving operations.

The NGDS will enhance the safety and efficiency of surface supplied air diving decompression procedures by supporting both air and in-water oxygen decompressions under control of a Topside Decompression Monitor (TDM). The TDM will prescribe Diver decompression schedules in real-time according to the actual depth-time profiles experienced by the Divers, not according to costly depth and bottom time roundup conventions required when such schedules are prescribed using conventional decompression tables. These prescriptions will eventually be obtained through real-time operation of a probabilistic decompression algorithm, with hardcopy decompression tables available only as backup in the event of TDM failure.

An NGDS component called the Oxygen Regulating and Control Assembly (ORCA) will support the decompression prescriptions of the TDM by providing air or 100% oxygen, as appropriate, to two working Divers and one standby Diver in the water. The ORCA has successfully completed unmanned flow testing at Cheatham Annex on 24 June 2004 and an open-water manned evaluation by U.S. Navy Divers at the Marianas Support Activity in Guam (See MDV Smith's article on page 3).

Topside; Red Diver... (continued)

Development of the Topside Decompression Monitor has progressed to assembly of a proof-of-concept system (TDM-POC) that uses the VVAL-18 Thalmann Algorithm, named in honor of its original developer, the late Captain Edward D. Thalmann, to provide one-second updates to a topside real-time display of Diver



NOT the NGDS! Not even close...

decompression obligations. The VVAL-18 Thalmann Algorithm is the basis for present MK 16 MOD 0 and MK 16 MOD 1 N₂-O₂ decompression tables, and has been extensively evaluated for applicability to air diving. It is also the algorithm operating in the Navy Special Warfare (NSW) Cochran Navy Dive Computer and associated Dive Planner. VVAL-18 Air Decompression Tables for in-water air, in-water air with oxygen, and SURD-O₂ decompressions have been developed, along with supporting instructions and emergency procedures, to backup the real-time operation of the TDM-POC. After the TDM-POC is tested for suitability as a source of real-time assessments and prescriptions of Diver decompression obligations, it will be fielded with the ORCA for Fleet use as an interim NGDS, pending development of the final probabilistic decompression algorithm for the final TDM.

Changing of the Guard: Old Copperhead

With the retirement of Old Copperhead ENCM (MDV) Jimmy Evans this past August, it is time to recognize our current Old Copperhead: **MDV Brick Bradford**.

The next SEALAB Reunion is scheduled to take place in Panama City, Florida on 10-12 March, 2005. Those interested in attending should contact Bob Barth at (850) 785-6249 or via e-mail at bob.barth@mchsi.com.

WDC/MDV Conference 2005 will be held at Keyport, Washington on March 28 - April 01, 2005. March 28 will be the MDV/CWO portion of the conference. Visit www.supsalv.org for more information.

HTCM (MDV/SW) Brick M. Bradford was raised in Orange County, CA. He reported for Boot Camp in San Diego, California on 4 February 1976. After completing Fireman Apprenticeship training, he reported to the USS CONSTELLATION (CV 64) as a non-designated FA. Two years later HT3 Bradford reported aboard his next command, USS ANCHORAGE (LSD 36).

HT2 Bradford then volunteered for Fleet Diver training. He graduated as a 2nd Class Diver in February 1981 and reported aboard USS DIXIE (AD 14) and then USS CAPE COD (AD 43) in May 1982. Petty Officer Bradford attended 1st Class Dive School in May 1983 where he graduated as class honor man.

Petty Officer Bradford volunteered for instructor duty at the Naval Diving & Salvage Training Center located in Panama City, Florida. He left four years later having put countless scores of officers, enlisted, and foreign military personnel through the rigors of Diver training. Petty Officer Bradford transferred in February 1987 having qualified as one of NDSTC's first unlimited diving supervisors and Master Training Specialists. He reported for duty in Diego Garcia.

Petty Officer Bradford reported aboard USS BOLSTER (ARS 36) in March 1988, where he served as the Damage Control Assistant. Two years later, HTC (DV/SW) Bradford volunteered for Master Diver Evaluations and was selected Master Diver on 8-31-1990... his birthday. HTC (MDV/SW)



CAPT Helmkamp and MDV Jimmy Evans at his Master Diver Retirement Ceremony in August 2004.

Bradford accepted orders to Subase, Pearl Harbor, Hawaii where he managed the Subase Diving Locker. HTCS (MDV/SW) Bradford transferred to Combat Support Squadron Eight located in Little Creek, VA in October 1993

where he served as squadron Master Diver. During this tour he completed part of a Mediterranean cruise aboard the USS GRASP (ARS 51) and participated in one of the Navy's largest salvage operations in 20 years, the recovery of an inland freighter sunk in Eritrea, Africa. The squadron was



Copperhead MDV Brick Bradford rigged in the venerable MK V.

disestablished a year later and Master Diver Bradford took orders to Explosive Ordnance Disposal Unit Two, also located in Little Creek, Virginia.

He reported aboard the USS BRUNSWICK (ATS 3) in April 1994. During his tour he served as the Senior Enlisted Advisor and command Master Diver. He also supervised a joint taskforce operation in Cambodia to recover the remains of U.S. Marines killed during the Vietnam War and is credited with bringing eight U.S. Marines home.

In April 1996 HTCM (MDV/SW) Bradford reported back to NDSTC for duty and worked with the Marine and EOD training teams until his transfer to Consolidated Divers Unit in October 2000. HTCM (MDV/SW) Bradford completed perhaps his most rewarding tour of duty as the Command Master Chief of CDU. He credits his satisfying experience to the pride he took in the achievements of his shipmates and the leadership of his Commanding Officer, CDR Eley.

HTCM (MDV/SW) Bradford transferred to NAVSCOLEOD in June 2003, where he serves today as the command Diving Officer and Master Diver.