THE FACEPLATE

DEEP SEA DIVING SCHOOL
EXPERIMENTAL DIVING UNIT

WASHINGTON D. C. 20390

Vol. I Number 7 December 1966

TORPEDO RECOVERY

In May of this year, the office of the Supervisor of Salvage was contacted by the Anti-Submarine Weapons Systems Command concerning the possibility of recovering torpedoes that had been lost earlier in the year during routine torpedo proof firings at the Navy Deep Water Tracking Range, St. Croix, Virgin Islands. Ocean Systems served as prime contractors for the operation. The staging vessel used was the Motor Vessel "Curb" from Merritt Chapman and Scott out of Staten Island, New York.

The moor was designed and modified by the Hydrospace Research Corporation.

Rigging, laying and recovering this moor was by Merritt Chapman and Scott salvage crew.

The underwater television search and recovery vehicle employed was the SORD system from the Naval Torpedo Station, Keyport, Washington.

Positioning of the staging vessel and the three "D" tracking of both the staging vessel and the underwater television recovery device, was accomplished by personnel of R.C.A. at the St. Croix Tracking Range.

Torpedo technical assistance was provided by personnel from the Naval Ordnance Test Station, Pasadena, California.

The basic concept of the operation was to position the staging vessel in a three point moor over the last known position of one of the lost torpedoes and then lower the wire controlled television vehicle to the bottom to locate and recover it. Many problems were encountered during the operation, and these were amplified by the fact that the entire operation had to be completed prior to 1 July because of the previous operational commitments of the Tracking Range.

Each of the original three mooring legs was made up as follows:

An 8000 pound Ells anchor, one shot of 2-1/2 inch anchor chain, 3300 feet of 8 inch circumference eight strand, plaited "Columbia" Nylon/polypropelene line and 3600 feet of 5 inch circumference, two in one braided "Sampson" Nylon/polypropolene to a spherical 1500 pound buoyancy buoy, thus each leg was 6990 feet from Jews Harp to Buoy. Each surface line from the ship to the buoy was 3600 feet of 5 inch circumference two-in-one braided "Sampson: Nylon/polypropolene."

The mooring legs were made up free for running, streamed buoy first and dropped without incident. However, when attempting to set taut in the moor the following morning, it was found that the eastern most leg had been cut or chaffed until it had parted at a depth of 1625 feet. (At this writing the damage to the Sampson line still lacks a satisfactory explanation as it was known to be undamaged when the buoy was streamed and the line couldn't have chaffed on the bottom as the depth of this leg was 2100 feet.)

That night another leg was rigged using an 8000 pound Ells anchor, a shot of 2-1/2" chain and 7200 feet of 5" Sampson line. This leg was streamed like the others and dropped without incident in the same location as the leg that had parted. The ship was then set taut in the moor and the search and recovery phase was commenced.

It was found to be relatively easy to place the ship over any position designated by the tracking station, however, due to the elasticity in the nylon mooring legs it was found that a very slight change in the current or wind condition would cause the ship to shift in the moor far enough to require repositioning.

Keyport's SORD television system worked very effectively. However, they too experienced several equipment problems. These could best be summarized by saying that the only pieces of equipment that broke down were those that quote, "can't break down," unquote. Because of the aforementioned problems, it was almost eight days from the time the ship arrived at St. Croix until the first torpedo was on deck. Once all systems were completely operational the recoveries became almost routine.

(CONT'D ON PAGE 2)

FACEPLATE

Published quarterly as an unofficial publication. This periodical is compiled and edited at the U. S. Naval School, Deep Sea Divers, with the assistance of the Experimental Diving Unit, Washington Navy Yard, Washington, D.C. The opinions expressed in this publication are those of the writers and do not necessarily reflect the official policy of the U. S. Navy. The purpose of the FACEPLATE will be an exchange of information between all men who work under the sea.

CDR W. R. LEIBOLD, USN	OFFICER IN CHARGE
LT D. G. DISNEY, USN	EDITOR
LCDR J. HARTER, USN	ASS'T EDITOR
LCDR R. C. BORNMANN, MC, USN	ASS'T EDITOR, MEDICAL
JACQUELINE A. GRIMES	TYPIST
M. MAXINE WELCH	TYPIST & DISTRIBUTION
PH2(DV) B. D. DOUTHIT, USN	PHOTOGRAPHER

Issuance of this publication approved in accordance with Department of the Navy Publications and Printing Regulations, NAVEXOS P-35. The FACEPLATE is printed on government owned equipment with appropriated funds.

EDITORS COMMENTS

LT D. G. DISNEY relieved LT E. H. SHIPP as Editor of the FACEPLATE. LT SHIPP did an outstanding job as Editor and I hope the momentum he generated will continue to carry on. The FACEPLATE is an informal yet authoritative publication for "all hands" either interested or active in diving. In order to accomplish this, the FACEPLATE must receive and publish all types of items from all geographical areas and from the various specialty groups engaged in underwater work. Only through your efforts can this publication continue to be a good one. In short, "let's communicate."

DSDS PERSONNEL

		FROM
RECEIPTS	ERNST, J.B.	NAVSTA, ROOSEVELT ROADS, P.R.
	FAIRBANKS, E.F.	USS FRONTIER (AD-25)
	ANDERSON, D.W.	USS COUCAL (ASR-9)
	ASHLEY, E.D.	DSDS - "B" Billet
TRANSFER	PULLEY, M.L., YN2	- DSDS to EDU

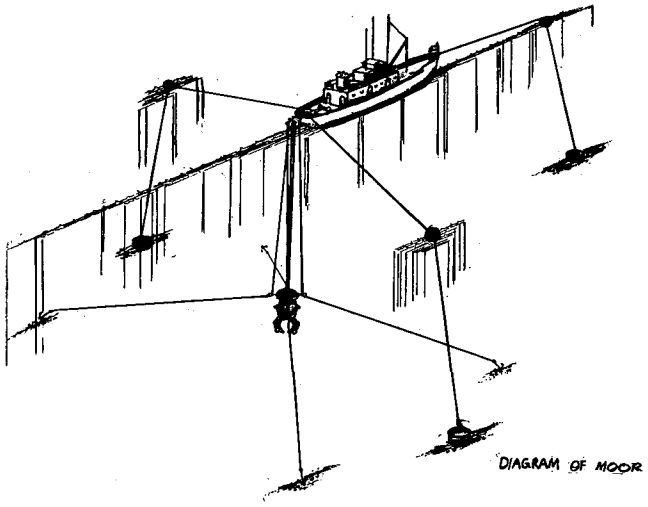
		FROM	TO	
PROMOTIONS	RIZER, J.D.	SF1	SFC	Dec 16, 1966
	McNEW, C.R.	HM2	HM1	Oct 16, 1966

RETIREMENTS
BMCS J.M. CLEVENGER - Transferred to Fleet Naval Reserve - 14 Oct 1966
EM2 W.H. COOLEY - Transferred to Fleet Naval Reserve - 31 Oct 1966
SFC C.W. ARMITAGE - Transferred to Fleet Naval Reserve - 22 Nov 1966

DSDS GETS NEW AOINC

LCDR W. C. KURZ, USN

Enlisted service included deck duties aboard four Pipe Destroyers prior to and during World War II. Appointed Warrant Boatswain in 1944 and served aboard the USS ARCTURUS (AKA-1) until April 1946. Duty thereafter included towing and salvage vessels, USS ATA-180, USS TAWASA (ATF-92), USS LUISENO (ATF-156), USS ESCAPE (ARS-6), USS KEYWADIN (ATA-213) and USS NIPMUC (ATF-157), in various capacities including command. Served ashore as Pilot, Portsmouth Naval Shipyard, Portsmouth, New Hampshire and instructor at U. S. Naval School, Ship Salvage.



(CONT'D FROM PAGE 1)

Throughout the entire operation the St. Croix Tracking Station proved to be very accurate in determining the position of both the ship and the underwater television vehicle.

During the operation a total of nine torpedoes were recovered from depths of 2700 to 3030 feet and additionally much valuable experience was gained both in deep mooring and in wire controlled television recovery.

EXPERIMENTAL DIVING UNIT

INCREASED UNIT ACTIVITY

The "Unit" has continued to see rapid changes in its plant facility. We have received and installed a new oxygen transfer pump manufactured by Pressure Products, Inc. This diaphragm compressor can move a maximum of 45 cubic feet of gas per minute when pumping from a cylinder at 1800 psi to another at 3000 psi. Its operation has considerably reduced the time previously required for gas mixing.

We have received two large gas stowage units from the Air Force. One is capable of storing approximately 35,000 cubic feet of helium when pressurized to 3000 psi. The other is a cluster of seven cylinders that is capable of storing about 25,000 cubic feet of helium when charged to 3000 psi. These tanks have been piped into the building from their location in the "alley" and terminate at the gas rack. Through the use of this stowage system we will now be able to accept our helium directly from a truck, pressurize the chambers at normal descent rates during saturation dives, eliminate the present manhours expended on cylinder handling, and restow the helium during decompression from saturation dives.

The helium reclaim system is expected to be delivered and installed by the time this issue of FACEPLATE is published. It will include a 1,000 cubic foot plastic bag into which the helium is vented during decompression. A compressor will take a suction from this bag and pump the gas through a series of filters and refrigeration devices that will take all the impurities from the gas. Pure helium will then be pumped back to the storage cylinders using the new oxygen transfer pump.

Future plans include adding an automatic gas mixing system to the gas handling equipment. These items will provide background information for use on equipments to be placed on the future diving ships and diving stations. The installation at EDU will also result in an increased dive and test capability due to the elimination of the major portion of helium costs and reduction of effort previously associated with cylinder handling.

We are presently conducting saturation dives using Man-in-the-Sea personnel as subjects. These exposures will include saturation at 450 feet with one hour excursions to 600 feet. The chambers have been outfitted with a steam heat system to make coffee and hot soup, and a small boat head that flushes into the building sewer system. Instrumentation abounds outside the chamber for various gas analysis and atmospheric controls.

Present projects include the evaluation of a new swimmer/diver-helmet for use with all types of breathing apparatus. It contains an oral-nasal insert, two-way communications, purge button and head protection. The shell of the helmet is hinged at the top and latched at the sides. It seals around the face and is free flooding around the remaining part of the head. This configuration provides a helmet of minimum weight and maximum ease in donning and removal. Its use on the Sea Lab III Project is contemplated.

NEW IDEAS

As a general rule divers are a breed of men whose ability to improvise is second to none. Unfortunately they are also distinguished by their reluctance to put anything on paper. In the past many a good idea has been lost to diving as a whole due to this failure to circulate knowledge. If you have any ideas for improving equipment, techniques, etc., send them to the U. S. Navy Experimental Diving Unit, who will be only too pleased to comment on your ideas.

Test dives using the fully closed-circuit constant partial pressure apparatus are being conducted regularly and improvements are being made by the manufacturer to increase the reliability as failures of components are noted. A large number of dives using the constant oxygen partial pressure apparatus have been made. The formulation of tables for use with this type apparatus is therefore being accomplished while the apparatus is tested.

Many gadgets have been constructed and tested to prove out basic concepts for inclusion in future equipments. The development and construction of the MK VIII semi-closed circuit system continues. It will be provided to the Deep Submergence System Technical Office at Ballast Point as an interim device to carry out training and testing at depths beyond the MK VI limits until improved equipment is designed, developed and proven reliable. All in all, the workload at EDU has increased about 200% from a year ago and all indications are that this will continue.

LT DONALD E. FOSTER, who relieved LT THOMAS E. KELLY, comes to us from USNAD Hastings, Nebraska. He enlisted in 1950 and has served on LST's, MSO, AE, been at V-W 11 and 13 in Argentia, NFLD, at EODU-1, at USNAD's in Hingham, Massachusetts and Hastings, Nebraska. He attended EOD school in 1953 and again in 1964. With this background we feel LT FOSTER is well qualified to fill this billet vacated by LT KELLY.

LT KELLY has been assigned as an exchange officer with the Canadian Navy.

TO ALL MK VI DIVERS: BUSHIPSNOTE 9230 is presently being rewritten to contain information for using the Differential Pressure Gage with Helium/Oxygen mixtures. However, it must be understood that this gage is designed to indicate a variance in gas flow after the equipment has been set up. Keeping this in mind, it is of little importance where the pointer is physically located on the dial face, within reasonable limits; i.e., not completely at positive stops, etc. As long as the operator knows where the pointer was originally he will be able to tell if the equipment is functioning normally. On tests conducted at NAVXDIVINGU it was noted the pointer would adjust to the left hand edge of the green portion of the dial face. Additional adjustments, while keeping within minimal limits, would not raise the pointer. Therefore, the use of the Differential Pressure Gage has not changed except for the diver knowing where the pointer was on the initial set up. The dial face will be changed to indicate N202 or He02 when additional gages are procured.

EXPERIMENTAL DIVING UNIT CONT'D

Some readers who have been following the remarkable achievements of Hannes Keller and his group of Swiss divers may not be aware that he and Dr. Buhlmann have published an article in an American scientific journal (1) describing his gas mixtures and his decompression methods. The following table describes the dives reported: (all time in minutes)

Number of Subjects	Depth in feet	Time on bottom	Bottom time	Decompression time
7	130	120	122	15
9	300	60	76	113
6	500	30	33	216
5	650	20	30*	220
2	800	10	30*	270
2	1000	5	30*	270

Although time at depth is clearly stated, the descent time is not exactly described. In several cases (*) the bottom time listed is the best approximation from inspection of the published material. (Keller checked out his gear in descent to 66 feet and breathed 100% oxygen during this period).

The article is interesting from a number of standpoints. Keller's technique was to change gas mixtures at calculated intervals to take advantage, he stated, of the different saturation speed of the gases used. He did not use hydrogen. He used mainly oxygen, helium, and nitrogen. Argon was used in the 130 foot dive during the last 50 minutes of bottom time and in ascent to 50 feet. Argon was also used in ascent during an early version of his 300 foot dive, however, its use was abandoned in later dives to this depth in favor of nitrogen. (Limited experience with argon at the Experimental Diving Unit supports the conviction that it has little usefulness in diving). Oxygen partial pressure also seems fairly high, by U. S. Navy standards, in many of his dives, and might not be safe in wet, working dives.

It is impossible to detract from the solid and impressive accomplishment of these dives. Nor is it possible to explain them adequately. Keller and Buhlmann in their discussion skirt around the problem of perfusion limitation which, according to Jones (2), would be the determining factor in decompression. All inert gases, regardless of density or molecular weight, come out of the body at the same rate, which is determined by circulatory perfusion.

The problem posed by Jones' measurements must be resolved before there will be a satisfactory explanation for the prodigious accomplishments of Keller and his group. Application to operational diving may have to await this explanation.

References:

1. Keller, H., and A. A. Buhlmann, Deep Diving and Short Decompression by Breathing Mixed Gases, Journal of Applied Physiology, 20:1267-1270, November 1965.
2. Jones, H. B., Respiratory System Nitrogen Elimination, in Medical Physics, Volume Two, Otto Glaser Editor, Year Book Publishers, Chicago, 1950.

EDU RESEARCH REPORTS

1-64	A Study of Carbon Dioxide Elimination from SCUBA, with standard and modified canisters of the U. S. Navy Closed Circuit Oxygen Rig, M. W. Goodman	1 May 64
2-64	Oxygen Decompression following Air Dives for use in Hyperbaric Oxygen Therapy, R. D. Workman	15 Dec 64
3-64	Carbon Dioxide Absorption Systems for SCUBA. 1. Quantitative considerations of design and performance of cylindrical canisters, M. W. Goodman	15 Jan 65
4-64	Decompression Sickness among U. S. Navy Operational Divers: An estimate of incidence using Air Decompression Tables, R. E. Doll	15 Feb 65
1-65	Adaptation of Helium-Oxygen to Mixed-Gas SCUBA, R. D. Workman and J. L. Reynolds	1 Mar 65
2-65	Decompression from Saturation Exposures on Helium-Oxygen by the Continuous Ascent Method, R. D. Workman	To be published
3-65	Hyperbaric Narcosis, M. W. Goodman	To be published
4-65	Carbon Dioxide Absorption Systems for SCUBA. 2. Theory and applications of a novel, non-cylindrical, low-resistance CO_2 absorption canister for SCUBA, M. W. Goodman and T. W. James	15 Jun 65
5-65	Minimal Recompression, Oxygen-Breathing Approach to Treatment of Decompression Sickness in Divers and Aviators, M. W. Goodman and R. D. Workman	15 Nov 65
6-65	Calculation of Decompression Schedules for Nitrogen-Oxygen and Helium-Oxygen Dives, R. D. Workman	26 May 65
7-65	Interrelationships of Several Parameters of Decompression Sickness, R. E. Doll	To be published
1-66	Summary Statistics; U. S. Navy Diving Accidents, T. E. Berghage	1 Jun 66
2-66	NAVSHIPS 1000 Revision Study, T. E. Berghage	1 Nov 66

Commands interested in obtaining a copy of any of the above reports may do so by contacting the Officer in Charge of Experimental Diving Unit.

SALVAGE SEAMANSHIP QUIZ

1. What was the Liverpool Bridle designed for?
2. What makes up the underwater leg of Beach gear?
3. The maximum amount of pull on one leg of Beach gear is?
4. What size of winch is needed for maximum pull on Beach gear?
5. What method is used in wiring Beach gear?
6. Beach gear blocks are rove with what size and length of wire?
7. What is the purpose of the fluid drive clutch in the Beach gear winch?
8. What hitch is used for securing the Beach gear pendants?
9. What is used to help prevent the Beach gear tackle from twisting?
10. What is the mechanical advantage of the Beach gear tackle?
11. What is the lift capabilities over the Bow rollers on the A R S type ship?
12. What size towing howser is carried on Navy salvage ships?

TREATMENT

On 7 October 1966, Donald W. RACE, A1C, aeromedical technician at Dover AFB was sent to NAVXDIVINGU-DSDS for possible decompression sickness. On arrival here he stated that on 5 October 1966 he had made two altitude chamber runs. In the morning he had an exposure to 39,000 feet and in the afternoon a second exposure to 43,000 feet ending at 1630. About 1700 he began to have pain in both elbows and later in both shoulders. He continued his duties and did not report his symptoms until the morning of 7 October 1966 when a consultation was requested. He arrived at NAVXDIVINGU-DSDS about 1700 on 7 October 1966 and was examined and diagnosed as a case of decompression sickness. At 1724 he was recompressed in chamber complex 2 on oxygen with IRELAND, HM2(DV) as the inside tender. After two minutes at 60 feet he reported complete relief of symptoms and a short minimal pressure oxygen treatment was used. The treatment and one hour observation period were uneventful and RACE was returned to 1607th USAF Hospital for observation. Though not a unique case for medical history, this is an unusual case of altitude decompression sickness with a time delay of 48 hours and forty minutes before undertaking treatment. Relief was dramatic and the use of "Table 5" developed by Captain R. D. WORKMAN and Doctor M. W. GOODMAN was proven once again.

CONTINENTAL SHELF

EXCERPT FROM THE MARINE DIGEST MAGAZINE - APRIL 23, 1966

For years, engineers puzzled over how it was possible to build the Pyramids. They finally concluded it was accomplished by eliminating the Egyptian's coffee break.

Engineers and scientists are now puzzling over the problem of how to explore the Continental Shelf, that great mass of land lying off our coasts, out to the 655-foot depth line. A score of treasures lie waiting, untapped: physical, mineral, chemical and animal resources which, as our normal supplies of these things are depleted, will be needed to satisfy man's wants - in numerous cases, man's vital needs for existence.

In June 1964, the United States signed an international agreement which grants each nation the right to explore and exploit its Continental Shelf to a depth of 655 feet and deeper where the capability exists to do so. The real sleeper in this agreement - and it is as binding as a treaty - is this phrase, "The rights to exploit natural resources of the seabed and subsoil of areas beyond the Continental Shelf may be obtained by the nation with the technological or engineering capability to first exploit them."

Literally, this means that the rights to extract, process, use or sell the resources beyond the shelf will go to those nations which first develop and use the instruments, equipment and technologies necessary to do the job. Major oil companies are gradually perfecting at tremendous cost their methods of taking oil from beneath the sea. Much more oil lies yet to be discovered. Already gold and diamonds are being mined beneath the sea, and new fishery resources, like the vast schools of hake off the Pacific Coast, have been located and plans are being carried out to utilize them.

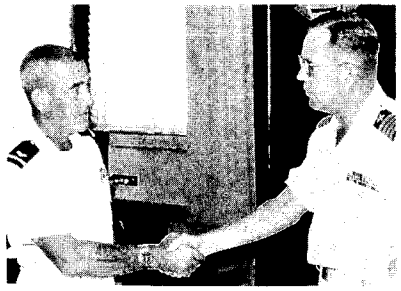
TRAINING

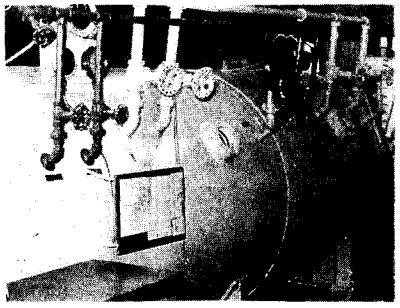
Fiscal 66 was a most gratifying and rewarding year. During this period the Deep Sea Diving School had a total input of 559 students of which 509 graduated. Of this number 119 were graduated as Diver First Class. Although this figure represents an appreciable increase as compared to fiscal 65, the shortage of divers first class in Navy remains critical. Figures as of 1 June 66 indicate a total of 430 divers first class on board out of an allowance of 744. In other words the diving Navy is presently functioning at about 60% of allowance. So, if you know of someone who is interested in becoming a diver and meets the qualifications but needs a push in the right direction, have him get his letter off to the Chief of Naval Personnel requesting a quota to attend the Deep Sea Diving School. I's sure his request will receive a favorable answer.

CASH AWARD

Chief Warrant Officer Charles H. Reustle was recently presented a check for fifty dollars by Captain Ray E. Oliver, Commander Fleet Activities, Sasebo, Japan. Warrant Officer Reustle received the check in consideration for a suggestion which he has made to create double lock recompression chambers using two old-type single lock recompression chambers. His suggestion is still under consideration and could result in an additional cash award if the Navy adopts his idea. As the Salvage and Docking Officer at Fleet Activities, Sasebo, Mr. Reustle has taken two old chambers and made his own double lock chamber at a considerable saving to the Navy.

Chief Warrant Officer Reustle is leaving Sasebo soon with his wife and two children for the USS FORT SNELLING (LSD-30) home-ported in Little Creek, Virginia. He leaves behind him an enviable three year record with the Ship Repair Department and other commands for whom he served in a temporary additional duty status. In addition to recognition for his chamber, he has recently received letters of commendation from Commander, Head Support Activity, Da Nang for his work on the Da Nang recompression chamber and from Commander, Service Group Three for his direction of salvage operations on the USNS SULTAN when she went aground off of Okinawa.



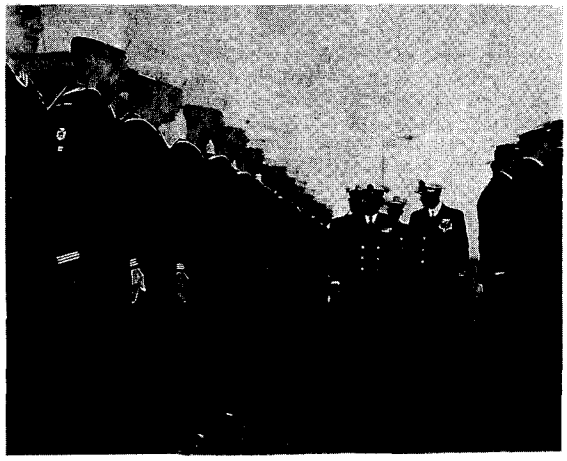


SALVAGE SEAMANSHIP QUIZ

1. It is a bridle designed so that you can maintain fine control over the towing ship.
2. Two 100 Fathoms, one 50 Fathom of 1-5/8" wire pendants, one shot of 2-1/4" chain, one 8000 lb. eells anchor, one large and two small plate shackles, and crown and buoy wire.
3. 45 to 60 tons
4. 7 ton line pull
5. Center to center method
6. 5/8" - 1200 ft long
7. To prevent the burning of the clutch while holding steady strain for long periods of pull.
8. A rolling hitch
9. The center to center method of reeving the blocks.
10. Nine to one
11. 150 tons
12. 2" x 6 x 37 coated

RETIREMENT CEREMONY

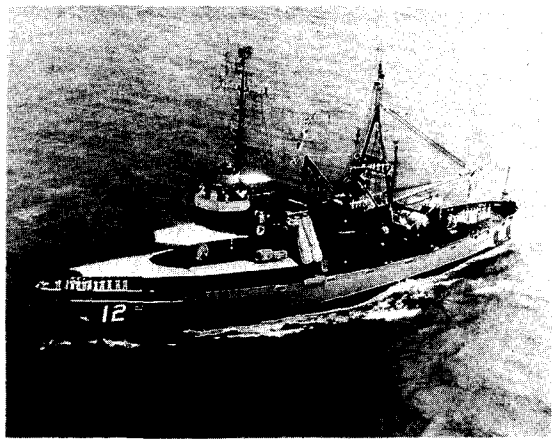
On 14 October 1966 a retirement ceremony was held at U. S. Naval School, Deep Sea Divers in honor of BMCS John M. Clevenger, MDV, who transferred to the Fleet Reserve this date after completing 22 years of naval service. Chief Clevenger became a Navy diver in 1952 and a Master diver in 1964. He is well known throughout the diving Navy having served in a diving billet aboard the USS COCOPA (ATF-101), Ship Repair Facility, SUBIC, USS SAFEGUARD and as a Senior Instructor at Deep Sea Diving School. Chief Clevenger and his family intend to settle in Sandy Hook, Kentucky.



BMCS John M. Clevenger, MDV in the company of CDR W. R. Leibold, Officer in Charge, U. S. Naval School, Deep Sea Divers, inspecting the Staff and Students.

BMCS John M. Clevenger, MDV departs U. S. Naval School, Deep Sea Divers in Navy tradition.

USS PENGUIN ASR-12



USS PENGUIN (ASR-12), commanded by LCDR R. PESCOTT, USN, has won the "Outstanding Ship in the Squadron" award and the Squadron Supply "E" in Submarine Squadron TWELVE for fiscal 1966. The announcement of these awards climaxed a year of hard work for her crew which saw PENGUIN consistently on top in the Squadron. Most notable of her many achievements was the commendation presented to LCDR PESCOTT by VADM LOWRANCE, COMSUBLANT for the outstanding assistance rendered during the fire on board USS BUSHNELL (AS-15) 6 December 1965 and the overall mark of 95.1% attained during the annual Operational Readiness Inspection conducted in March 1966.

PENGUIN is believed, by this writer, to be the first ASR to win the title of "Outstanding Ship" in a submarine squadron.

Diving operations have been mostly routine although we did get another look at the MK.6 recently on an operation with EOD. We are now conducting requalification escapes (buoyant ascent) for submarine personnel in Squadron TWELVE whose qualifications have lapsed. These are done in the basin from a depth of 18 feet utilizing an open bottom bell suspended from the main boom.

As I write this we are in Miami representing the Diving Navy at the Convention of the Underwater Society of America. Ed LINK's Sea Diver II and the Perry-Link Submarine PLC-4 are among some of the more interesting things here, not to mention several interesting and enlightening speakers.

Since PENGUIN's last report in FACEPLATE we have lost LT Marty PAUL to FLORIKAN and are due to lose JOSENHANS, SFC to BUSHNELL in September. BIGGER, BMC is on board to relieve "Joe" as Master. Other divers on board are: D. A. JONES, BMC; A. A. PEREZ, BMC; J. E. ANDERSON, BM1; M. P. CATO, BM1; F. J. SMELKO, SF1; K. K. KIRBY, EN1; R. L. CAVE, EN1; W. A. GHOLSON, TM1; W. L. LAVENDER, SF1; V. E. HUDSON, DC1; J. W. COLE, EM1; W. J. PIETRUSZKA, TM1; L. G. KELLY, CS2; W. P. LEE, SFM3; E. E. STOERMER, ETN3; W. A. GALDERISE, EM3; C. L. ROEMER, EM1 and W. A. MINER, HM2. Diving Officers are LCDR R. PESCOTT, Commanding Officer; LT J. J. McDERMOTT, Executive Officer and LTJG R. G. MILLER, First Lieutenant and Diving Officer.

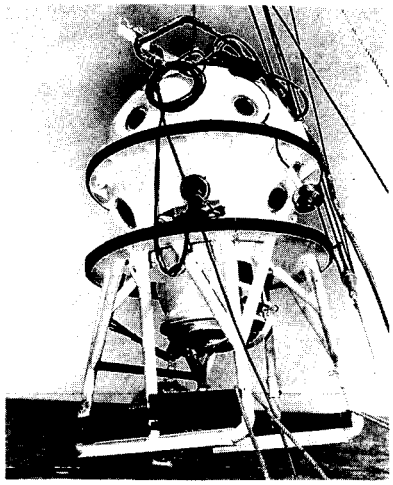
ADVANCED DIVING SYSTEM TESTED IN PACIFIC

"As this operation terminates, all hands are pleased to have been part of this endeavor which set a new record in the U. S. Navy for deepest swimmer dive and deepest personnel transfer capsule dive, and made a significant contribution to U. S. Navy Ocean engineering." This was part of a message sent to Commander Service Force, U. S. Pacific Fleet on August 14 from fleet ocean tug USS APACHE (ATF-67) at the conclusion of trials for an advanced diving system that allows divers to stay at great depths for long periods of time.

A record dive of 440 feet was made by Chief Boatswain's Mate Richard Villasenor using a conventional non-heated wet suit with swim fins, a weight belt and a specially designed helium oxygen supplied helmet. This new U. S. Navy open sea diving record for underwater swimmers was made from APACHE off San Clemente Island near San Diego on the morning of 14 November 1966.

The Advanced Diving System (ADS) is a product of Ocean Systems, Inc., a division of Union Carbide Corp. The trial was a joint COMSERVPACSUPSALV effort with participation by Experimental Diving Unit, Submarine Medical Center, New London and Harbor Clearance Unit ONE.

ADS is a prototype of the Personnel Transfer Capsule and Deck Decompression Chamber (PTC/DDC) systems designed for the new construction salvage tugs to be built by the Navy. In the ADS system, the PTC is lowered and atmospheric conditions are maintained until it reaches the predetermined diving depth. After pressurization of the chamber, the swimmer, with the specially designed helmet, can then leave the capsule and stay down for an extended length of time. The old Navy system (hard hat diving) would allow a man to stay at deep depths for only short periods with extensive stage decompression required afterward. In turn, when the PTC is raised to the surface it is mated to the DDC in order to decompress the diver; or in the case of saturated diving, he can be maintained at pressure for subsequent return to depth.



The Personnel Transfer Capsule used in the deep diving system is lowered over the side of the USS APACHE. Atmospheric pressure is maintained until the capsule reaches the bottom.

Richard Villasenor, BMC, shows the diving helmet he used in the record-setting 440-foot dive to the future Sealab III site.

The ADS or PTC/DDC system can be quickly and easily outfitted for permanent installation on any relatively small, tug-type ship to support deep recovery or deep salvage operations. This automatically includes Service Force ships such as fleet tugs and salvage ships. With this in mind, COMSERVPAC plans to have at least one deep dive system in the Pacific for use in deep salvage operations. When required, this system will be airlifted to and installed temporarily on the Navy ship nearest the scene of diving operations. Specially trained COMSERVPAC divers and medical personnel will also be deployed to the scene to operate the system. After the conclusion of operations, the system will be returned to its base until needed again.

Chief Villasenor made the descent to the future Sealab site in 10 minutes. Once there, he climbed out of the PTC capsule and surveyed the area, also staking out a sign welcoming the Sealab III personnel. Results of the survey were recorded by television on video tape.

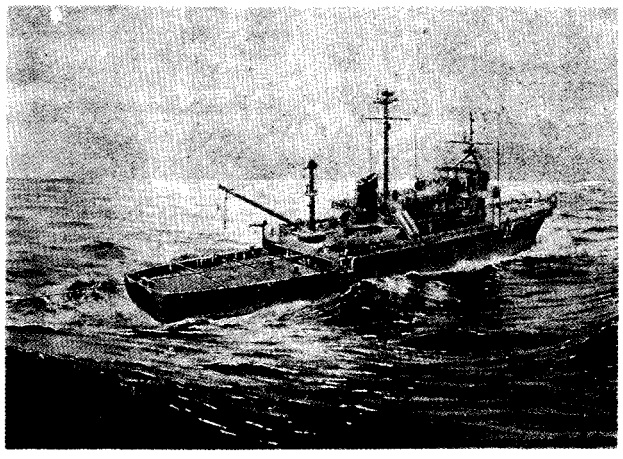
Chief Villasenor is attached to Harbor Clearance Unit ONE, the Navy's newest combat salvage organization which is based in Subic Bay.

IN MEMORIAM

On 21 November, 1966, HMCS Donald E. Aanerud, USN (Ret) passed away at Durham, North Carolina. Burial services were held at the Arlington National Cemetery. Chief Aanerud retired from the Navy on 4 February 1963 after 20 years of service. He graduated from the Deep Sea Diving School, 15 February 1950. At the time of Chief Aanerud's death, he was employed at Duke University as a hyperbaric chamber operator.

Out deepest and heartfelt sympathy go out to Chief Aanerud's family.

NEW SALVAGE TUG ATS



A new concept in salvage ships that will allow for greater capabilities in providing salvage repair, diving, rescue, and towing services to the Fleet is presently being built for the Navy.

The new ship, called a Salvage Tug (ATS-1) will be larger than the ARS and will contain more facilities for salvage work. The ATS will be out fitted with two workshops outfitted for handling sheet metal, carpentry, pipe fitting, cutting and welding. The diving capability includes deep sea air and mixed gas systems. A new deep diving technique presently under development (Personnel Transfer Capsule and Deck Decompression Chamber) will also be installed which will greatly extend the operational depth of her divers.

The ship will be powered by four diesel engines producing a total of 6000 S.H.P., driving two controllable reversible pitch propellers. General specifications of the new ship are:

length overall - 282 feet, 8 inches
beam overall - 50 feet
displacement, full load - 2929 tons
draft, full load - 14 feet, 6 inches
range, at cruising speed of 13 KTS - 10,000 miles

Lift capabilities of the new ship are being designed for conducting 300-ton bow lifts.

An automatic towing machine with two primary drums and one auxiliary drum will also be installed. The two primary towing drums will each carry 3000 feet of 2-1/4 inch towing cable with a breaking strength of 416,000 pounds. The auxiliary drum will carry 5000 feet of one-inch towing cable with a breaking strength of 85,000 pounds.

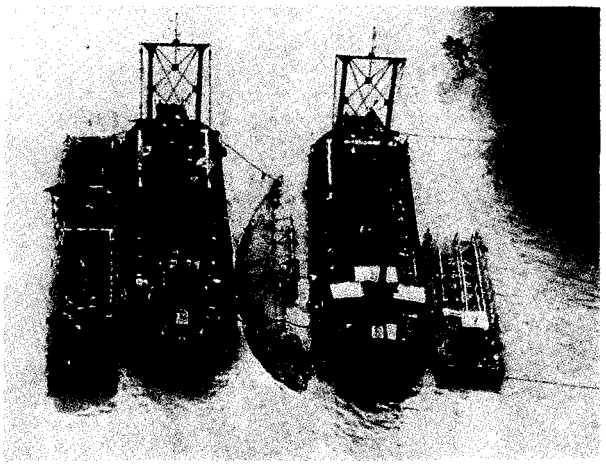
The new ATS will have accommodations for nine officers and ninety-three enlisted personnel.

HARBOR CLEARANCE UNIT ONE

Harbor Clearance Unit One, the Navy's newest salvage group, has nearly 200 hand-picked officers and men who are all salvage experts. The Unit is internally divided into four harbor clearance teams and a headquarters staff.

Four 146-foot heavy lift craft are assigned to HCU-1. Each craft is capable of a 300-ton bow lift and a 750-ton side lift. They operate in pairs for a combined lift of 1500 tons. Three light lift craft, converted LCU's, are also assigned, giving the Unit more versatility in salvage diving. The latter are also equipped with a 25-ton bow lift and have alongside fire fighting pumps and a fire monitor. A YDT was converted for use as a salvage support barge and houses messing and berthing for the team and the headquarters staff.

Harbor Clearance Unit One, on call at all times to assist in salvage operations, stands ready on six hours notice to deploy anywhere in Southeast Asia to perform their services.



French Steamer Paul Bern suspended between two heavy lift craft following removal of the ship from the Mekong River

SPLICING WIRE ROPE

The question frequently is raised concerning the use of swaged or mechanical splicing techniques for making eyes on wire rope.

NAVSHIPINST authorizes the swaged or mechanical splices and states that they are "superior in appearance, easier to make, and stronger than a manual splice." Most Naval Shipyards are now equipped to make the mechanical splices in smaller ropes; some have presses large enough for 1-5/8" diameter beach gear wires.