THE FACEPLATE

DEEP SEA DIVING SCHOOL
EXPERIMENTAL DIVING UNIT

WASHINGTON D. C. 20390

Vol. I Number 6 August 1966

OPERATION SEALAB III PLANNED

BY CDR J. M. TOMSKY, USN

SEALAB III is tentatively proposed during the summer of 1967 off San Clemente Island, at a depth of 400 to 450 feet. The operation is under the direction of the Deep Submergence Systems Project (DSSP). The combined efforts of the following activities performing their assigned tasks, comprise the working elements of the program.

U.S. Naval Ordnance Test Station, Pasadena, California - Support Vessel and operations.

U.S. Navy Experimental Diving Unit, Washington, D.C. -- Diving tables and equipment.

U.S. Naval Submarine Medical Center, U.S. Naval Submarine Base, New London, Groton, Connecticute -- Physiology

U.S. Naval Medical Research Institute, Bethesda, Maryland -- Thermal protective devices.

U.S. Navy Mine Defense Laboratory, Panama City, Florida -- Engineering instrumentation support.

Hunters Point Division, San Francisco Bay Naval Shipyard, San Francisco, California -- Modification of SEALAB habitat.

OBJECTIVES

To acquaint divers and all other interested personnel with SEALAB III, the following objectives have been set forth. They represent the broad scope of the various milestones necessary to advance in the art of extended underwater work and exploration.

a. To establish man in a habitat at 430 feet, with excursion dives to 600 feet, the limit of the continental shelf. This is the first and primary objective of SEALAB III; all other objectives are incidental.

b. Determine feasibility of utilizing surface supported divers operating from submersible decompression chambers. This will be done by pressurizing the deck decompression chamber to the same environmental conditions of SEALAB, then transfering selected personnel from the habitat to surface tat for overnight stays.

The procedure of conducting a shipboard SEALAB, transporting personnel to the bottom in the submersible decompression chamber for a work shift, may be of extreme importance in effecting ship salvage, and providing a greater degree of mobility covering a wider area.

c. Test and evaluate tools, processes, and procedures developed for underwater salvage and object recovery.

d. Test and evaluate current state-of-the-art diving equipment for use at deep depths for prolonged periods.

e. Conduct physiological tests and monitoring as necessary to evaluate human response under the stated hyperbaric conditions.

f. Conduct tests to evaluate human performance capabilities during prolonged exposure.

g. Test and evaluate equipment and thermal-protective clothing designed to enhance prolonged exposure to cold water environments.

h. Attempt to establish most feasible means of conducting bottom survey, contouring and location identification.

i. Test and evaluate swimmer's propulsion units commensurate with bottom environment - if units are available.

j. Evaluate a system of sustaining a hard-hat diver from SEALAB III. The need for hard-hat type diving is no less important for certain tasks to be accomplished by the saturated diver than for surface supported divers.

EQUIPMENT

Major pieces of equipment and support facilities exclusive of the habitat proper will be:

a. Surface support vessel converted and modified from an LSMR. The LSMR is being modified under the supervision of the U.S. Naval Ordnance Test Station, Pasadena, California, for use as the Deep Submergence Systems Project Range Ship.

b. Deck Decompression Chamber (DDC) and Personnel Transfer Capsules (PTC) which are to be completely new designs over those used during SEALAB II.

(Cont'd page 6)

FACEPLATE

Published quarterly as an unofficial publication. This periodical is compiled and edited at the U. S. Naval Diving Center, 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.

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EDITORS COMMENTS

LT E. H. SHIPP, USN

The results of a recent memorandum to recipients of FACEPLATE requesting verification of address and postal ZIP code or general comments has been very rewarding. Many replies included very constructive comments which will assist in future publications. Your efforts are greatly appreciated.

Any articles including photographs desired for publication are most welcome. I would like to emphasize that "FACEPLATE" is primarily to serve as a medium of exchanging information between men who work under the sea both military and civilian. Articles can include or be specifically for all areas of underwater endeavers, i.e., operations conducted, design of equipment, safety,time saving methods, maintenance and upkeep of equipment, technical aspects of equipment operation and general news items.

Since inception of "FACEPLATE" in its present format in May 1965, distribution has grown from approximately 200 to 600 addressees. Thanks to the fine work of LT Ed "Deacon" DOWNEY who recently departed for a tour in USS FLORIKAN (ASR-9) the mechanics of newspaper publishing has been established. I will do my utmost to follow in his footsteps and maintain the future issues as in the past.

DSDS PERSONNEL

RECEIPTS

LCDR W. C. KURZ, USN, from USS NIPMUC (ATF-157)
LT S. McNEASE, Jr., USN, from USS ORION (AS-18)
DCCS(DV) J. W. BAILEY, USN, from USS PETREL (ASR-14)
BMCS(DV) J. C. BROWN, USN, from USS TRINGA (ASR-16)
DC1(DV) J. B. ERNEST, USN, from Roosevelt Roads, Puerto, Rico
BM2(DV) E. F. FAIRBANKS, USN, from USS FRONTIER (AD-25)
EM2(DV) D. W. ANDERSON, USN, from USS COUCAL (ASR-8)

TRANSFERS

QMC(DV) W. E. BENT, USN, Master Diver to Man-in-the-Sea Program
GMGC(DV) A. C. BEARD, USN, to Fleet Submarine Training Facility, Pearl Harbor
BMCS(DV) J. M. CLEVENGER, USN, Master Diver to Fleet Reserve in October 1966

OINC DEPARTS

CDR C.H. HEDGEPETH,USN

On 20 July, 1966 I will be relieved as Officer in Charge by Commander W. R. LEIBOLD, USN, who needs no introduction to the Diving Navy. I am confident that through Commander LEIBOLD's leadership the diving navy will receive the recognition and support it so much deserves.

I depart most reluctantly as my period of service here was without question the high point in my Naval career. The accomplishments are many; some well known to all of you; and some which will not become apparent for many years. Conversely the period has also been marked with tradgedy, heartbreak, frustration and failure. Throughout it all the support from and the privilege of association with, the most magnificent group of men in the Navy, THE DIVERS, has been most gratifying.

I will report to CNO (Op-43) for duty, which I assume officially separates me from the underwater navy. Let me assure you, however, that I will continue to support you in every way I can and will always be available to assist you either individually or collectively at any time or place. So don't hesitate to ask.

The future is bright, but nothing worthwhile comes easy and the sincere co-operation and hard work of all is required if the goals are to be reached. "GOOD LUCK AND GOOD DIVING".

HE02 ASSOCIATION

On 9 May 1966 at the Chief Petty Officers Club, U.S. Naval Base, Groton, Conn., the first meeting of the HeO2 Divers Association was held with an attendance of 150.

Norbert G. BEUKELAER, USN(RET), was elected President of the new association. Application for a Connecticut State Charter was voted for in the affirmative. Other officers named were: Vice President - Charles KINCAID, 20 Fulmer Dr. Waterford, Conn.; Secretary - Vincent J. HARRINGTON, 19 Dolphin Rd., Mumford Cove, Conn.; Financial Secretary - Anthony P. COTUGNO, 538 Highland Dr., Ledyard, Conn.; Correspondence Secretary - Harry COXWELL, 9 Seventh Ave., Waterford, Conn.; Liason and Security - LT Dock JOPLIN, U.S. Naval Submarine Base, Groton, Conn.; Liason and Publicity - LT Joseph MURRAY, USN, 19 Fifth Ave., Waterford, Conn.;

Carlton J. ROBERTSON of New London, Conn., and Garvie MOLUMPHY of Berlin, Conn., were named to the board of directors which will also include the appointed officers.

Our heartiest congratulations are extended to the efforts of this newly formed group, and we look forward to it having a great expansion and a lasting medium of communication among HeO2 Divers. Next issue of FACEPLATE will cover further details of the association.

SHIP SALVAGE

CAPTAIN W. F. SEARLE, JR., USN

SUPERVISOR OF SALVAGE, U.S. NAVY

The following article is extracted from the 20 May 1965 issue of the magazine, Shipping World and Shipbuilding. The Author is Captain J. DUBBELD, Head of Salvage Administration for L. SMIT and Company, of Rotterdam. L. SMIT is one of the largest ocean towing and salvage firms in the world.

"Despite manifold and improved navigational aids and stringent safety regulations for sea-going vessels, mishaps to shipping occur all round the clock. The threats which a ship is exposed to are ever present. Constant alertness and vigilance on the part of the officers and crew are needed and still the unexpected can happen and is as often as not unavoidable.

"In fact, there are numerous kinds of events which may happen to place a ship at the mercy of wind and sea.

"Some ship casualties are spectacular, others just ordinary accidents or hazards of ship operation. Large or small, in case of mishap, they call for all those qualities on the part of salvage tugs, which are required and expected from them. In many cases quick aid may prove to be of utmost importance to ship and cargo.

"Within the frame of this article we shall only mention one section of ship-rescue, viz., of vessels afloat, with engines broken down, with lost rudders or propellers, ships on fire by explosion or otherwise, those in collision, in fact ships that have become immobilized by the perils of the sea and require outside help to get to a port of refuge.

"However important to shipping, the number of deep-sea or oceangoing salvage tugs only constitute a relatively small percentage of the world's merchant ship tonnage, but nevertheless it is remarkable what important services these units spread all over the globe, render to the world's shipping community.

"Out of this small fleet a handful of salvage tugs are stationed, always ready to proceed at a moment's notice. They can be found at strategic points along the main shipping routes, such as the Western Approaches, at Bermuda, at Horta in the Isle of Fayal (Azores) and St. Vincent (C.V.), at St. John's (N.F.), but also in the Persian Gulf, the Caribbean, the Mediterranean, Aden and Singapore.

"Salvage is as old as the world and the nature of salvage work on the high seas has developed in such a way, that in most cases a ship in trouble may expect speedy aid to get out of her predicament. The stricken vessel may be only a few miles off, or it may be some thousands of miles from the nearest station-base, but the salvage tug will be found in readiness to speed through the seas to its aid. A distress signal is a call both to adventure and useful service to shipping on the high seas.

"It is, however, obvious that the ever increasing size of the modern tanker and bulk-carrier also requires new classes of ocean going salvage tugs. Owners and underwriters must have been gratified to note that during the past years several salvage tugs of up to 9,000 h.p. have been put in commission.

"In many cases a casualty's fate depends on some salvage tug or tugs, fitted with salvage gear and heavy towing equipment, being in position to get to the distressed ship quickly.

"The modern high-powered and fast salvage tug is a very specialized vessel. It is extremely maneuverable allowing the Master to approach close to the casualty, which is essential for making a towing connection. Especially in bad weather this is a very difficult operation which must be accomplished in only minutes, and the tugs have been designed to perform such maneuver as well as possible.

"In addition to being able to tow the casualty and effectively render assistance to the nearest safe port in any kind of weather the modern salvage tug has powerful mobile portable pumps on board. In serious collision cases these portable pumps may be installed on board to pump leaking compartments of the crippled vessel thus keeping her afloat whilst the tug is towing. To tranship the heavy gear and portable pumps to a helpless ship drifting in turbulent seas can be dangerous and much skill is required from the crew of the salving tug.

"The tugs themselves are, moreover, equipped with diving gear, patching material, heavy salvage anchors and wires to use as ground tackle for ships ashore, burning - and welding-plant, fire-foam and monitors.

"One of the most essential parts of any deepsea tug's equipment is the towing-equipment and as long as towing gear has been in use--first hemp, then manila and steelwire ropes, and at the present time nylon combined with steel-wire-rope--the size and consequently the strength of material has been determined by the experience gained by the operational personnel of tug companies.

"A rich store of experience was gained in the course of years about hawsers, in theory and in practice, what might or might not be expected from the gear under widely varying conditions of weather. Extensive research work had to be done to find the best product for particular applications.

"Fire at sea is one of the worst disasters that can befall a ship. Deadly, because of the speed with which it may spread. A fire can start deep in the heart of a cargo and smoulder for days without being located. No protection and detection system in the world, however, complete, is proof against a fire accident at sea.

"In spite of the very elaborate precautions to be found in a modern ship, fires at sea still occur, and there is no doubt that they will continue to happen. The history of ship operation is full of fire accidents, but the history of salvage is full of examples of methods employed to fight them with success. Over the years after World War II the fire fighting equipment on board salvage tugs has been continuously improved. We may regard the modern fast salvage tug as a well-equipped floating fire-engine, one of the most important instruments of both fighting fires at sea and towing the crippled casualty to safety.

"Here again it is obvious that because of their great tonnage and large cargoes modern "super" ships present new problems when in need of salvage assistance of whatever kind. But in most cases they can be met.

"Considering this it is clear that the professional salvor must be thoroughly acquainted with the anatomy of ships, cargo handling, the laws of floatation, wind and weather, currents, and even then he can only hope to achieve success if the salvage equipment at his disposal is equal to the calls made upon him.

"Salvage is always a gamble and often a bitter struggle between man and sea. Considering that one can hardly foresee whether a rescue attempt will ultimately be crowned with success, or how long it will take, it is understandable that such jobs can hardly ever be contracted for fixed prices....

"Every year the winter storms in the Atlantic, the shamals in the Persian Gulf, the hurricanes in the Caribbean, the cyclones or typhoons in Chinese and Japanese waters claim their victims. Although man will never cease to try to perfect the ships which sail the seven seas, the sea will never cease to take its toll.

(Cont'd page 4)

SHIP SALVAGE(cont'd)

"No article in this field or activity can be concluded without a solemn tribute to the men who operate the salvage ships.

"The most specialized and expensive floating salvage equipment can only render useful service to the shipping community at large if the men who sail their ships have skill, experience, a sense of comradeship and cooperation and above all, devotion for the career they have chosen."

EDU SUPPORT

LCDR J. HARTER, USN

The U.S. Navy Experimental Diving Unit is presently undertaking a number of tasks in support of project SEALAB III which is expected to take place next summer in approximately 430 feet of water.

These tasks are categorized as equipment, decompression schedules and procedures, and training. The major effort in equipment is the design, manufacture and test of the diver's breathing apparatus. We are presently completing the design and prototype construction of a unit that has been labled the Mark VIII Semi-Closed Circuit Breathing Apparatus. The MK VIII functions essentially in the same manner as the MK VI. The Mark VIII however is designed to operate as a hooka apparatus with gas supplied from high pressure banks in the habitat or from a gas supply in cylinders carried by the diver. A two way ball valve is provided to select the gas supply. The hose from the habitat is attached by means of a quick disconnect. This allows the diver to drop the hose, continue as a free swimmer using the gas from his cylinders, and to reconnect the hose if desired to go back to the hooka mode of operation.

The standard double 90 cubic foot aluminum cylinders will provide the diver with about one hour swimming time at 450-600 foot depths with 1000 psi remaining in the cylinders. The gas supply from the cylinders will be regulated by a grove Mity-MITE, internally loaded regulator modified to allow setting without the use of tools. This regulator will maintain a constant pressure at depths to 1000 feet. The flow of gas will be controlled by means of a gas flow control block designed by GARRAHAN, Richard, 492 00 08, MR1(DV), USN, This block provides a bypass valve and orifice selector switch. The proper orifice for the flow required is placed in the block and the liter flow is adjusted by means of the regulator pressure. Once the proper orifice has been placed in the block, the set up operation requires only adjustment of the pressure regulator while reading the onput on a flow meter. This is a simpler process than the MK VI procedure which requires setting the pressure and adjusting a needle valve.

At present we are diving 450 feet for ½ and one hour durations to work up decompression schedules for surface support diving from the personnel transfer chamber. Decompression will be accomplished in a deck decompression chamber located on the support vessel.

Beginning in September, saturation dives to 450 feet with excusion to 600 feet and return to the 450 foot depth will be accomplished. All SEALAB divers will go through a series of work up dives to the 450 foot depth.

A system to capture and purify the gas bled from the chamber during decompression is being installed. This will provide a means of restoring pure helium after a saturation dive for later use.

This work will be accomplished while continuing with the presently programmed work in the Swimmer Support System.

Visitors during the fall and winter of this year can expect to see the Unit in full two tank operation.

DSSP PERSONNEL

With the establishment of the Deep Submergence Systems Program (DSSP) there exists a requirement for initial input of personnel and a continuing program of replacements. A recent change to the Enlisted Transfer Manual NAVPERS 15909, Chapter 9, is reprinted below as an informational guide to active duty divers and submariners.

THE PROGRAM

The Deep Submergence Systems Program was instituted to develop new methods for submarine location, undersea escape and rescue and salvage operations as well as to extend the Navy's capability and knowledge of saturated diving operations and their relations to oceanographic, human engineering and salvage operations. The two major components of the Deep Submergence Systems Program are the Man-in-the-Sea Program and the Deep Submergence Vehicles Group.

Personnel selected for the Man-in-the-Sea Program are presently being ordered to the Submarine Medical Center, New London, Connecticut; the Mine Defense Laboratory, Panama City, Florida; and the Experimental Diving Unit, Washington, D.C. in the absence of an assigned homeport; however, upon assignment of a permanent home port, they will be reassigned. This duty is a normal tour of shore duty.

Personnel selected for the Deep Submergence Vehicles Group will be ordered to Commander Submarine Squadron THREE, San Diego, California. The Deep Submergence Group is classed Preferred Sea Duty and is considered neutral time for rotation of enlisted personnel.

QUALIFICATIONS

The following qualifications are required for assignment to the Deep Submergence Systems Program:

a. Qualified diver, especially NEC 5342, in case of Man-in-the-Sea personnel (Aquanauts).

b. Deep Submergence Vehicles personnel must be submarine qualified.

c. Must meet the current physical requirements for diving or submarine duty as set forth in the Manual of the Medical Department (MANMED).

d. Aquanauts must be less than 40 years of age or obtain a waiver.

e. Thirty-six months active obligated service required at time of transfer.

f. Must be recommended by commanding officer.

SUBMISSION OF REQUESTS

Letter requests for DSSP duty may be submitted by qualified personnel to the Chief of Naval Personnel (Attn: Pers-B2126) via the commanding officer, the appropriate Enlisted Personnel Distribution Office (EPDO) and the Director, Special Projects, Washington, D.C. All requests should include the following information:

a. Expiration of active obligated service. (Agreement to extend enlistment if required.)

b. Any particular skills or experience.

c. Component requested (Man-in-the-Sea Program or Deep Submergence Vehicles).

d. Other information required to substantiate the qualifications required by Paragraph 9.71 above.

Qualified personnel will be notified and placed on a list awaiting a vacancy.

IN TRAINING

LT AMARASINGHE

A medical officer from the Ceylonese Navy will be researching at the U.S. Naval Radiological Defense Laboratory in San Francisco, California for the next seven months. He is Surgeon Lieutenant Milinda AMARASINGHE, a native of Ceylon who earned his medical degree at the University of Ceylon Medical College in 1959.

Doctor AMARASINGHE came to the United States specifically to attend a two month course in Diving Medicine conducted at the U.S. Naval School, Deep Sea Divers, Washington, D. C., to qualify him as a Diving Medical Officer in the Celonese Navy. This completed, he spent brief periods of time at the U.S. Naval Medical Center, Bethesda, Maryland and at the U.S. Navy Underwater Swimmers School, Key West, Florida.

OLD MASTERS QUIZ

1. What is the rate of ascent on all treatment tables unless otherwise indicated?
2. What is the rate of descent when treating a case of air embolism?
3. What does spontaneous pneumothorax refer to?
4. Following treatment on table 2, the patient has a recurrence of pain. Describe procedure you would follow.
5. What treatment would you give a diver who complains of pain in the right elbow and does not receive relief at 165 feet for 30 minutes.
6. After 16 minutes of treatment on table 2 at 50 feet the patient notices visual disturbances. What procedure would you follow?
7. What gas law applies to Air Embolism and squeeze?
8. "Bright red" lips would suggest what type of gas poisoning?
9. What is the proper treatment table for a diver who blows up from a 150 foot dive after 20 minutes bottom time, symptoms free?
10. What is the usual cause of CO_2 poisoning in Deep Sea Diving equipment?
11. What Naval personnel are authorized to modify the treatment tables?
12. Under what conditions can HeO_2 mixtures be used on all treatment tables?
13. What is the maximum depth allowed for a NORMAL working dive breathing pure oxygen?
14. What is the proper treatment for a diver being treated on table 1-A who has a recurrence of the same symptoms at 20 feet?
15. What factor determines whether we use table 1A or 2A?

MASTER ON DUTY

GMC(DV) Robert J. SCHNEPF, USN

MASTER DIVER

USS CHANTICLEER (ASR-7)

Enlisted in Navy September 1942 and attended "Boot camp" at Corpus Christi, Texas. Transferred after completion of boot training to Naval Air Station, Pensacola, Florida and worked in wet basic on crash boats and Mary Anns. First contact with diving was here where I worked as a tender and at the seemingly endless turning of the old MK 3 pump. Unable to qualify as a second class diver due to transfer to the amphibious training unit at Little Creek, Virginia and duty aboard an LSM in the Pacific in 1943-45. Attended electric hydraulic school in Washington, D.C. in the early part of 1946. From there on duty was performed aboard USS COUCAL (ASR-8) homeported Pearl Harbor, and participated in the Bikini resurvey of 1947. Returned to diving school in the fall of 1947 for a refresher course in HeO2. From there enjoyed a fine liberty cruise aboard COUCAL while she was standing by three subs that had been turned over to the Turkish Navy. Departed COUCAL in Panama in late 1948 and reported aboard USS GREENLET in 1949 homeported in San Diego. In 1952 I found my self on board COUCAL again and in 1958 I was ordered to NOTS Pasadena Annex for 3 years of the best Abalone and Bug diving on the west coast, naturally outside of regular working hours. Transferred to USS NEREUS (AS-17) in November 1961 and reported to diving school for cross-over training and masters course in May 1963. Designated Master Diver 5 September 1964. Reported on board USS CHANTICLEER (ASR-7) in August 1965 to present time.

IN MEMORIAM

On 24 June 1966, Warrant Officer William R. SAVAGE was killed at Saigon, RVN. The Bos'n's death was caused by a mooring bit which snapped off at its base and struck him. Bill was serving at the time as the Assistant Officer in Charge of Harbor Clearance Team-Three, a component of Harbor Clearance Unit-One based at Subic Bay.

On 21 May 1966, Adolph A. HAPPEL, MNC(DV), USN(RET), passed away at the U.S. Naval Hospital, Bethesda, Maryland. Burial was at Trinity Memorial Cemetery, Waldorf, Maryland. Chief HAPPEL entered the Navy April 28, 1943 serving in Pacific Fleet ships until entering Underwater Demolition Teams and Explosive Ordnance Disposal work. Graduated from Deep Sea Diving School on 31 March 1948. Retired from active Naval Service on 23 August 1965 while at Explosive Ordnance Disposal Facility, Naval Propellant Plant, Indian Head, Maryland.

Our deepest regrets and heartfelf sympathy go out to the families of Bos'n SAVAGE and Chief Petty Officer HAPPEL.

SEALAB III(cont'd)

EQUIPMENT

c. The life support system for the habitat will remain essentially unchanged except to provide for a greater degree of forced ventilation.

d. The life support system for the deck decompression system will consist of a newly designed external unit which will remove undesirable contaminants such as carbon dioxide, carbon monoxide; control humidity; and provide thermal control.

e. A unique development which will result in dollar savings is the means for recovering helium gas for reuse.

f. Efforts will be made to use all known systems of underwater communications such as diver-to-diver and diver-to-tender. Underwater communications involving a free swimmer breathing helium are currently unsatisfactory for open water use. Problems of communications are germane to swimmer safety, consequently every system must be investgated.

g. SEALAB III personnel will be swimming in newly developed heated suits for thermal protection against effects of cold water.

MANPOWER

Manpower requirements for SEALAB III are difficult to establish. Basically, personnel will consist of both officer and enlisted personnel attached to the Man-in-the-Sea Program, officer and enlisted personnel on temporary duty status from participating activities and research laboratories, civilian personnel from various support groups as well as civilian scientists from oceanographic institutions, Bureau of Commercial Fisheries, and Bureau of Mines. Also, personnel at various government laboratories are involved in testing and analysis of remote samples though not actually located at site of SEALAB operation.

As a result of reviewing SEALAB II, it is estimated that at least 400 individuals may have some part or contribution to the execution of SEALAB III. More precisely, however, it is estimated that approximately 125 individuals will be required at the actual operating site.

The 125 people will consist of those selected as Aquanauts, surface support divers, civilian shipboard crewmen, and topside equipment handlers. Other topside personnel will be engaged in scientific, physiologic and psychological test, evaluation and monitoring programs.

HABITAT

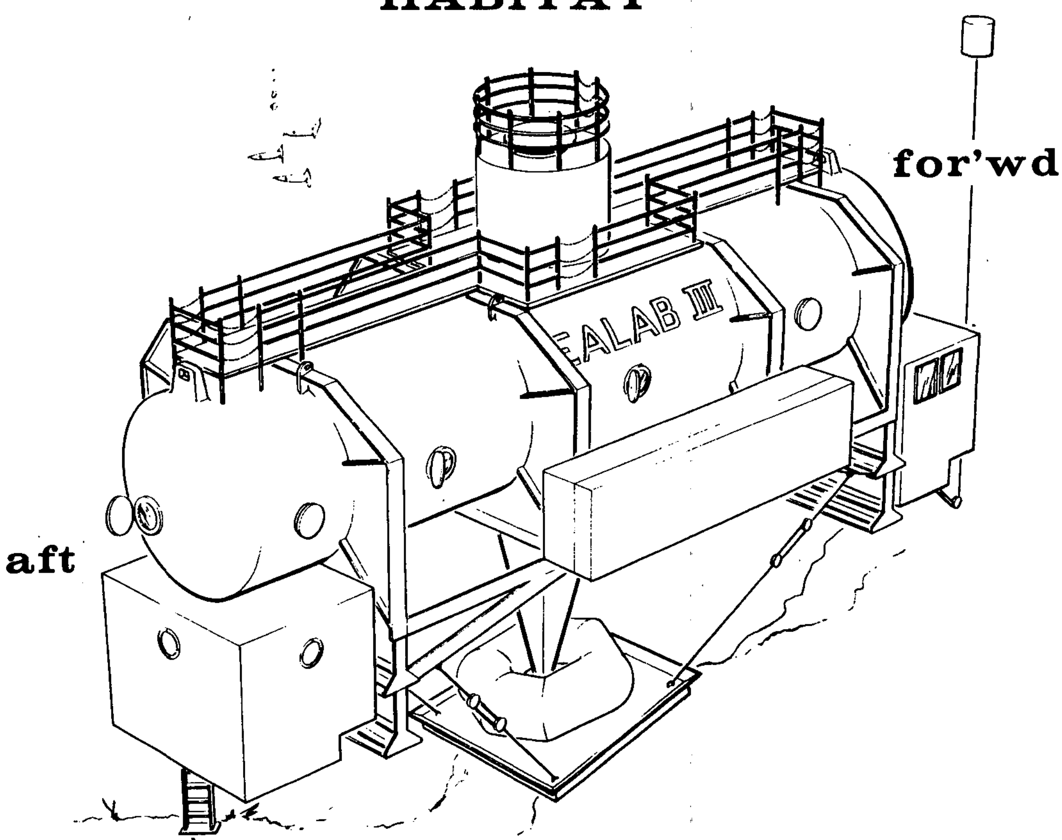

FIG. 1

It is expected that the SEALAB II habitat will be used for SEALAB III with the following modifications made: (See Fig. 1)

a. A dry compartment will be placed on each end of the habitat below the living level.

b. The after compartment will become the diving locker, diving station, and main access area.

c. The forward compartment will be used for dry stores storage and rigged with special viewing ports for underwater observations and marine studies.

(Cont'd page 7)

SEALAB III(cont'd)

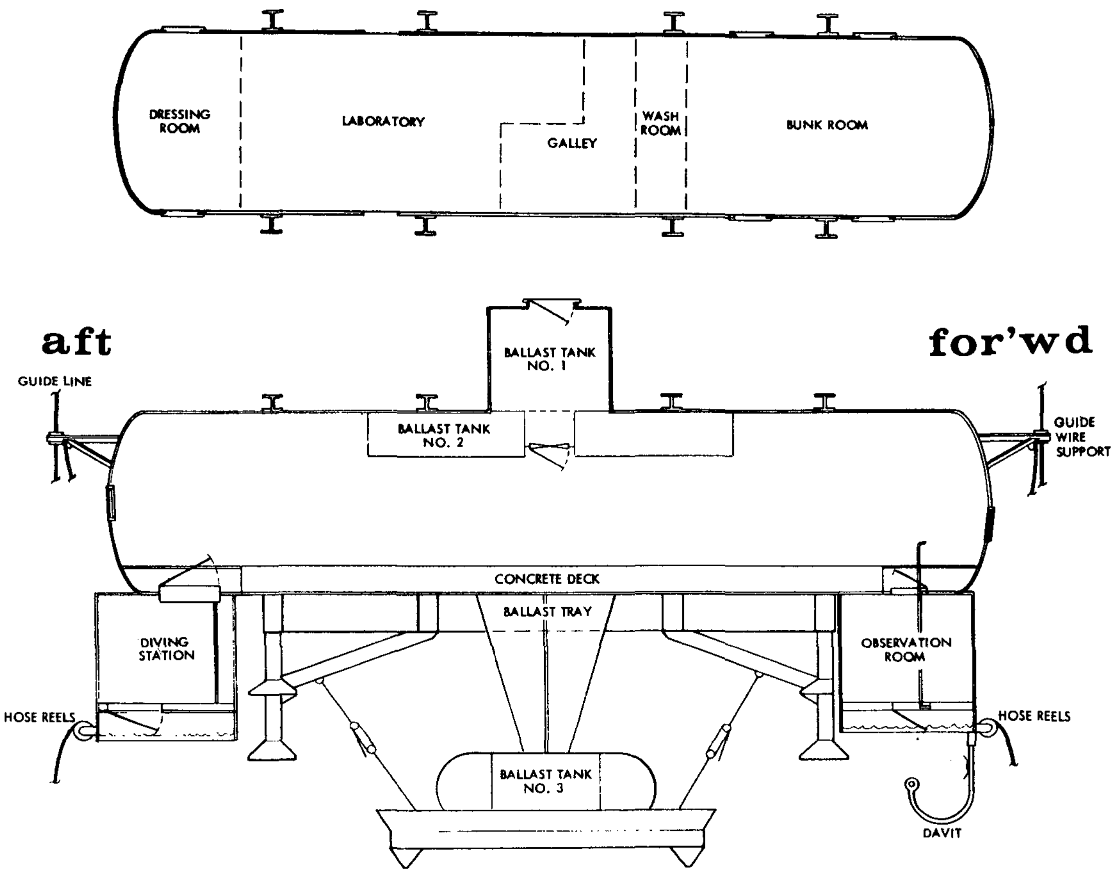

FIG. 2

Further changes to the SEALAB II structure are modification of the legs with devices to enable leveling of the structure while resting on the ocean floor, and providing a greater capability for variable water ballast.

The environment will consist of a mixture of oxygen, helium and some nitrogen for breathing atmosphere. The habitat while submerged will be self-sufficient concerning the supply of oxygen and helium with additional equipment for scrubbing carbon dioxide, carbon monoxide and other atmosphere contaminants from the respirable gases. It is planned that four teams of eight men each will inhabit the SEALAB for a total of 60 days, 15 days for each team.

BASIC STRUCTURAL ARRANGEMENT

1. The main cylindrical structure 57½ feet long and 12 feet in diameter, with semi-elliptic ends, fabricated of inch-thick mild steel to ASME unfired pressure-vessel standards and designed to withstand an operating pressure differential of 125 psi. (See Fig. 2)

2. A conning tower, 8 feet in diameter and 7 feet high, located amidships.

3. An observation room located beneath the bow of the cylinder.

4. A diving station located beneath the stern of the cylinder.

5. A large ballast tank suspended from the midship section of the cylinder by a universal joint.

BALLASTING AND BOTTOM-PLACEMENT PROVISIONS

Both fixed and variable ballast are provided for the habitat. Fixed ballast includes the concret decks used in the main cylinder, diving station, and observation room, as well as lead ballast in various locations. Variable ballast is provided by means of three floodable tanks: Ballast Tank #1 is the conning tower, located amidships, with a capacity for 11 tons of sea water; Ballast Tank #2 is located amidships in the main cylinder, with a capacity for 14 tons of sea water; Ballast Tank #3 is the large tank suspended from the midship section of the main cylinder, situated on a lead-lined tray with anchoring spades mounted on the underside, and has a capacity for 14 tons of sea water.

During both the lowering and raising operations, the main cylinder, diving station, and observation room remain dry. All hatches are closed and the skirts below the diving station and observation room are flooded.

To facilitate accurate positioning of the habitat on the bottom site, two guide wires are attached between 10-ton clumps and submerged floats. Guide-wire supports, situated on outriggers attached to the fore and aft ends of the main cylinder, ride down the two guide wires, thereby keeping the habitat properly oriented during the lowering process.

(Cont'd page 8)

SEALAB III(cont'd)

An automatic gas-compensating system provides continual presurization of the habitat as the craft is lowered to the bottom, maintaining a 15 psi positive differential pressure over the ambient sea pressure.

When the habitat reaches bottom, 18 tons of negative buoyancy drives the anchoring spades (located on the underside of Ballast Tank #3) into the seafloor, thereby securely emplacing the habitat on the bottom. The universal Joint connecting Ballast Tank #3 to the positively-buoyant main cylinder allows the habitat to level itself (with the assistance of portable lead pigs for trim, if necessary). The restraining preventers between the main cylinder and Ballast Tank #3 are then adjusted by the Aquanauts to secure the habitat in a level position, as the arrangement allows for a bottom tilt of 15° in all directions.

Prior to surfacing, the habitat must be broken loose from the bottom suction. After the prolonged period on the bottom, the blowing of Ballast Tank #3 and hoisting from the surface support ship may not be sufficient for break-out, in which case additional ballast may have to be blown to attain positive buoyancy. To prevent an unchecked surfacing of the habitat after breakout, slack preventers are attached from each end of the habitat to the guide-wire anchoring clumps. After the break-out is accomplished, negative buoyancy is re-established, the slack preventers are disconnected, and the habitat is hoisted to the surface. A relief valve located near the deck of the diving station permits the gas to bubble out, hereby maintaining a positive 15 psi pressure differential between the habitat atmosphere and the ambient sea water during surfacing.

TOWING AND HANDLING PROVISIONS

Lifting pads provided on the main cylinder for hoisting the habitat in and out of the water, with special slings designed for these operations. Towing chocks are provided fore and aft.

DIVING STATION

The primary access to the habitat is provided through the diving station, with a 48-inch-square rectangular hatch located in the deck of the diving station, and a 48-inch-diameter circular hatch located in the deck at the stern of the main cylinder, directly above the diving station. A ladder is provided for entry to the diving station from the water, and another ladder is provided within the diving station to allow access from the diving station to the main cylinder.

The diving station provides space for the Aquanauts to don and doff their diving gear, to check out their breathing regulators and other equipment, and to rinse, dry, and stow their diving dress and breathing apparatus. A bench is provided along one side, with stowage below, for adjusting breathing apparatus. Racks are provided for storing and drying the SCUBA packs and vests. A bar is suspended from the overhead for hanging and drying the wet suits. A dual hot water shower is included to provide quick warm-up for two returning divers simultaneously, with wash trays along the bulkhead adjacent to the shower for rinsing of gear.

The deck of the diving station is concrete, with radiant-heating cables embedded therein, to maintain a comfortable temperature within the station. In addition, overhead radiant heaters are provided. Four 12-inch viewing ports are also provided, one in each side of the diving station.

VIETNAM

Recent correspondence shows establishment of diving facilities at the Naval Support Activity, Danang, Vietnam. Divers on board are: LT H. BECHTEL, Diving Officer, EN2(DV) J.L. STARCHER, BM2(DV) D.C. FITIZGERALD, DC2(DV) J.L. BRADY, DSDS wishes the unit "GOOD LUCK and CLEAR WATER".

CHANTICLEER CRUISE

The divers on board "CHANTY" would like to report on our recently completed "R & R" WESTPAC deployment. No major jobs came our way although we were on a standby status on several occasions. We laid four point moors and held bell operations followed by requalifications and indoctrination diving operations in both Manila and Okinawa. It was a pleasure to renew old diving acquaintances in Alongopo, over a cool San Miguel, with divers from Subic, Harbor Clearance Unit, the BOLSTER and RECLAIMER. Looked like an old divers conventions and it did get pretty deep.

In the diver candidate procurement and training field, any non diver aboard who was physically qualified was given an opportunity to make a "hard Hat" dive, which not only stimulated interest in diving but served also as a "morale booster". Of these personnel, six were selected for diving school as all personnel did not show interest in furthur training, especially after experiencing the weight of the old MK 5. An operation aptly named "Head Start" was then lit off which through the media of lectures, films and actual dives served as a basic familiarization with diving theory and equipment prior to assignment to a regularly scheduled school. Due to operational commitments this training was limited to "Hard Hat" only.

Then the "CHANTY" became "a ship of opportunity" for oceongraphic surveys on two occasions, first assisting personnel from the U.S. Naval Electronics Lab, San Diego; later assisting personnel from the U.S. Naval Oceonographic Office, Washington, D.C. It enabled us to have a basic understanding of the oceonographic sciences. So add another to the long list of ASR capabilities.

Needing ballast to replace the money left in various ports of call, and the ASR's being the submarine morale boosters they are, we loaded an "air house" cargo of various and sundry goodies for transportation to Pearl and San Diego, compliments of the "CHANTY". Transportation fees will be cheerfully accepted in any club.

Divers currently on board are:

LCDR M. T. GRAHAM, Commanding Officer, LT B. M. HILLMAN, Executive Officer, LT R. L. WITTEN, Diving Officer, LT C. A. CHAPMAN, Operations Officer, GMC(DV) R. J. SCHNEPF, HM1(DV) L. S. STOKES, MR2(DV) R. H. ALLEN, BM1(DV) W. E. STEPHENS, EM1(DV) C. L. HORTON, MM1(DV) J. C. WOODARD, GMG1(DV) C. P. SWENSON, MM1(DV) B. R. WILSON, ST1(DV) G. W. CLEAR, EN2(DV) R. E. LANGLEY, ENC(DV) R. E. CRUTCHFIELD, EM3(DV) D. C. KLEINHANS, SF1(DV) G. E. PATTERSON, DC2(DV) J. G. MUNDY,

OLD MASTERS QUIZ (answers)

1. 60 seconds between stops.
2. As rapidly as possible
3. Air in the chest cavity.
4. Recompress to the depth of relief, never less than 30 feet for never less than 30 minutes, and complete treatment according to table III.
5. Treatment table 2 or 2A
6. Remove mask, ventilate chamber and shift to table 2A remaining at the 50 foot stop for 14 minutes.
7. Boyle's Law
8. Carbon Monoxide.
9. Table 1 or 1A
10. Inadequate ventilation.
11. Submarine Medical Officers.
12. In place of air but not in place of O_2, at all depths and on all tables.
13. 25 feet.
14. Recompress to a point of relief, never less than 30 feet for never less than 30 minutes and decompress on table 4.
15. Depth of relief.