Faceplate

FALL 1971

Engineering Duty Officer goes over the side during SCUBA training at the Underwater Swim School in Key West, Fla. (see page 16).

Faceplate

Vol. 2 No. 3

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Editor-in-Chief
LCDR William I. Milwee

Assistant Editor-in-Chief
LCDR Edson Whitaker

Managing Editor
Carol Jess

Art Director
Leo R. Gwinn

Graphic Artist
Kenneth H. Ross

...the official magazine for the divers of the United States Navy.

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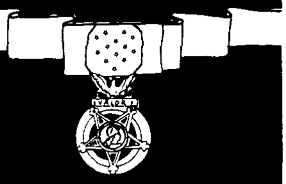
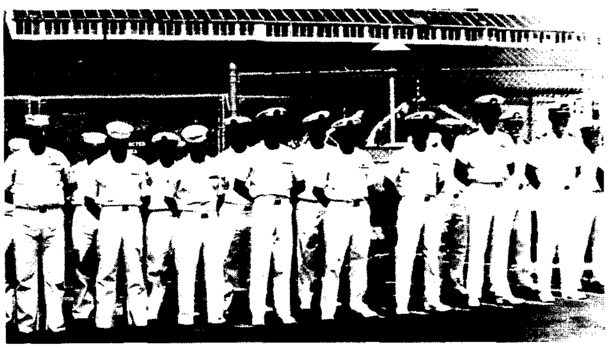
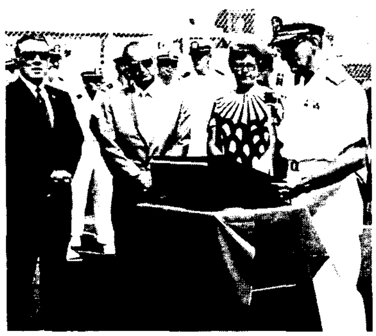


EDU, CIVILIANS: The Experimental Diving Unit, Washington, D.C., received a Meritorious Unit Commendation during a recent special award ceremony at the Unit. The award was accepted by LCDR W. I. Milwee, Jr., present Officer in Charge of the Unit, and CAPT E. B. Mitchell, Officer in Charge of the Unit during the period covered by the citation.

The ceremony also honored two civilians. RADM Nathan Sonenshein, Commander NAVSHIPSYSCOM, presented the Navy Meritorious Public Service Citation to Robert H. Canary and Robert E. Kutzleb, for their contributions to the successful recovery of the submersible DRV ALVIN.





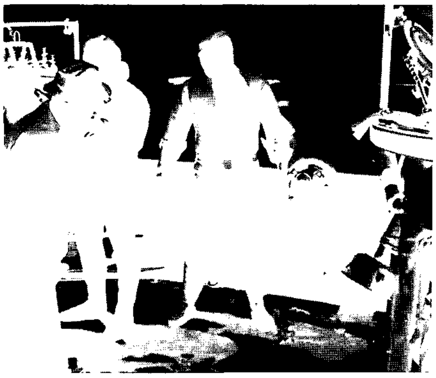
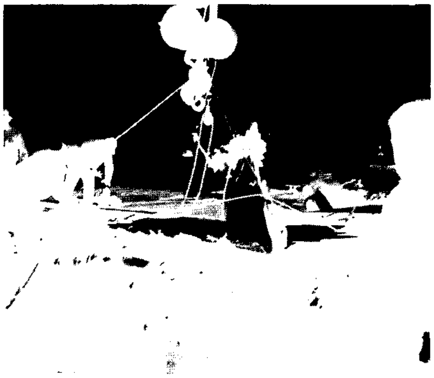
Above, from left, officers and men of EDU observe ceremonies at the Navy Yard. LCDR Milwee accepts Meritorious Unit Commendation from RADM Sonenshein. RADM Sonenshein reads citation honoring civilians Canary and Kutzleb who were awarded Navy Meritorious Public Service Citations.

BMC SALYERS: Chief Boatswain's Mate (Master Diver) Ira S. Salyers recently received the Navy Commendation Medal for "Meritorious Service" from 1 May 1969 to 29 June 1970 while serving as Master Diver aboard the USS PENGUIN (ASR 12).

The citation accompanying the decoration and signed by ADM C. K. Duncan, Commander in Chief U.S. Atlantic Fleet, commended Chief Salyers for his competence, initiative, resourcefulness, and loyal devotion to duty.

Pictured at right, Chief Salyers is presented with the medal by CDR R. H. Campbell, USN Chief Staff Officer, Naval Undersea Research and Development Center, Long Beach.

B-52 Recovery: Mission Possible

In mid-May the Supervisor of Salvage was called upon to assist in the second stage of a recovery mission which had been started in January, when ice, snow, and gale force winds had caused the abandonment of the project. The recovery of an Air Force B-52 bomber which had been lost, unaccountably, during a simulated bombing raid in Lake Michigan near the hamlet of Charlevoix, Michigan, was the object of the search.

In this second phase a civilian salvage ship, "Sea Systems," was provided by Ocean Systems, Incorporated, who also furnished key personnel and divers for the recovery operation. Representing SUPSALV on scene were LT James W. Walker and Lenny Milner. The Air Force was represented by COL Robert Saye, President of the Accident Investigation Board.

Even in May the foul weather conditions prevailed, bringing severe rain and wind, high seas, fog and lightning which caused delays and made recovery difficult.

Using a side scan sonar, TV cameras, and ADS IV bell for observation, plus the OSI salvage ship and a salvage barge, the crew still found operations bogged down because of the brutality of the weather. Visibility on the bottom was from two to six feet in most places due to the turbulence topside.

Piece by piece, the B-52 was found and hauled by winches aboard the salvage barge for future examination by Air Force experts.

Helium was used in the 39^{o} F water along with Unisuits to keep the divers warm at the 240-foot depth. Minimal thermal protection was found in these suits which need a layer of air to be effective. Decompression problems were almost nonexistent in the more than 30 dives. One diver reported symptoms of skin bends which were quickly treated.

Close cooperation among the civilian, Air Force and Navy personnel helped the assignment to have a successful conclusion. Air Force experts will examine the remains of the plane, which lay on the bottom for almost five months, to determine the cause of the crash which cost the lives of nine crew members, and to try to prevent such tragedies from recurring.

NEW VEHICLE STUDIES MARINE LIFE

Virtually unrestricted viewing of marine mammals and fish is provided by a new experimental research vessel designed and developed at the Naval Undersea Research and Development Center. SEA-SEE comprises an octagonal compartment, installed on a catamaran, that extends 10 feet into the water and permits 180 degrees of visibility fore and aft.

The compartment is 7.5 feet long with clear plastic hemispherical ends. It accommodates two observers and also permits photography and sound recording of mammals and fish. The eye level of the occupant seated in the compartment is about six feet below the water surface.

SEA-SEE allows observers to follow underwater action without gaps in the field of view.

SCUBA REGULATORS AND COLD WATER

During exposure suit evaluations in subfreezing waters at Point Barrow and Fletcher's Ice Island (T-3), Alaska, pertinent information concerning regulator performance in cold water was obtained.

The SCUBA cylinders used were twin steel, 72 cubic-foot with "J" valves, and one regulator on each cylinder. A total of 12 regulators was used including nine single-hose and three double-hose. Each single-hose regulator froze in the free flow position at least once during use despite many other trouble-free performances during similar dives. Therefore, several factors influence regulator performance.

The two most obvious regulator problems in this environment are the precooling of the regulators and introduction of moisture during rinsing. Precooling refers to the exposure of the regulators to the cold for a period of time prior to the dive. The second problem involves rinsing with fresh water, commonly resulting in residual moisture on the piston surface of the first stage of the single-hose regulator. In subfreezing temperatures this will form ice crystal nuclei which accelerate the first stage freezing.

An important discovery during these tests was that the double regulators did not malfunction during the diving operations.

It is an obvious conclusion that at the present time only a double-hose regulator is suited for cold water diving. Due to the freezing of single-hose regulators at 36° F all cold water SCUBA diving in water colder than 38° F should be conducted with a double-hose regulator. This policy will stand until such time as a single-hose regulator is produced or a modification is devised to allow it to perform properly in subfreezing water.

WHAT'S NEW AT THE MOVIES?

A new submarine rescue and salvage procedures film is being produced. It is a three-part film; two parts being complete and available. The third part is scheduled for completion by October 1971. Be sure to see it at your local diving locker.

Title	Film Number
Submarine Rescue and Salvage Procedures, Escape Part A	MN 10541A
Submarine Rescue and Salvage Procedures, Rescue Part B	MN 10541B
Submarine Rescue and Salvage Procedures, Salvage Part C	MN 10541C

(Note: Part C is not available at this printing)

Consult your current Navy Film Catalog for ordering and use instructions.

DIVER REENLISTS, UNUSUALLY

DC1 (DV) Eldon D. Ashley, USN, was reenlisted recently by his commanding officer, LCDR R. D. Benites, on the main deck of a submarine. Ordinarily this would not be considered unusual, but in this case, the submarine USS BLUEGILL (SS 242) was sitting in almost 130 feet of water near Lahaina, Maui, Hawaii. Ex-BLUEGILL was bottomed off Maui in 1970, for submarine rescue and salvage training purposes.

Ashley is attached to the submarine rescue vessel COUCAL (ASR 8), homeported in Pearl Harbor. The COUCAL was conducting diving operations for training purposes on the decommissioned BLUEGILL when the time came for Ashley's reenlistment. His skipper, also a qualified Navy diver, donned "hard hat" diving gear, and descended to ex-BLUEGILL's deck for the official ceremony.

Communication between the two divers was conducted through a diver-to-diver sound system, controlled from the COUCAL.

NOTICE: HYPERBARIC CHAMBER LISTING AVAILABLE

In a diving emergency with a need for a hyperbaric chamber, information concerning the location of a chamber is available by calling the Experimental Diving Unit, Washington, D.C. Whether the need is for civilian or military, the location of any chamber in the world is available through the EDU duty officer. The number to call for this information is (202) OX3-2790.

These chamber listings are being distributed by the Director of Diving, Salvage, and Ocean Engineering to state Boards of Health, Coast Guard Districts and Naval Districts where the latest information concerning the location of hyperbaric chambers will be available.

COLD GAS STUDIES CONTINUE

Research to study respiratory heat loss in deep diving, under the sponsorship of the U.S. Navy Office of Naval Research, and the Navy's Bureau of Medicine and Surgery, has recently been concluded.

Three divers spent 23 days in the Westinghouse Ocean Research and Engineering Center's hyperbaric facility under pressures that ranged from those found at 450 feet to 1000 feet of water.

The debilitating effect of respiratory heat loss is receiving much attention from the Navy. In order to minimize this heat loss, it is necessary to have precise data upon which to base equipment designs.

Preliminary results suggest that the three divers studied in this experiment do not differ significantly from those in the EDU/NMRI dive of the previous year. It was again noted that deep dives requiring heavy work while breathing cold gas constituted severe physiological stress. Data obtained from this dive will allow the establishment of safety limits and can be utilized in the design of respiratory gas heating equipment.

In addition to the primary research on respiratory heat loss, the experimenters performed extensive tests on advanced diving apparatus and techniques, and made helium speech experiments for later analysis.

NEW HOME IN PEARL HARBOR

Harbor Clearance Unit One, formerly of Subic Bay, RP, is now homeported in Pearl Harbor, Hawaii.

Due to the slowdown of American participation in Vietnam and the rapid turnover of equipment to the Vietnamese in the Vietnamization program, HCU-1 now has only one contingent located there.

HCU-1's YRST is also permanently located in Hawaii where it will see duty on an upcoming deep dive near Makai later in the fall.

Still on call, however, HCU-1's latest involvement has been to help in recovering ships in the aftermath of a recent typhoon in Hong Kong.

ESSM to Streamline Salvage Operations

Ship salvage operations often require material not available on site. All salvage ships carry the basic equipment such as pumps, generators, air compressors, beach gear, and welders, but are not capable of in-depth support for major operations. The Emergency Ship Salvage Material (ESSM) system was developed during World War II to support such large operations and augment deployed salvage ships.

Since the end of World War II the system has been modified and new equipment introduced, without, however, management and operational guideline modifications. Change in fleet characteristics, theaters of operation, and the advent of high speed and large tonnage air cargo planes has warranted a review of the ESSM system.

Under the direction of CDR R. B. Moss, Deputy Supervisor of Salvage, the Base and Pool Realignment Team was tasked with streamlining the ESSM system. Team members were selected from shipyard and fleet activities reflecting personal operating experience averaging over 22 years per man. Mr. Boyd Russell, Ships OOC-SO41, directed the team and was assisted by LT W. H. Key, SRF, Guam, design superintendent Mr. L. D. Tower, Puget Sound Naval Shipyard, General Forman Shop 72, CWO R. D. Tucker, Diving and Salvage Officer SRF Subic RP; Mr. A. Rynecki; and SFC (DV) R. L. Warren, Experimental Diving Unit. The team worked during June and July, 1971, in Washington, D.C. and Long Beach, Calif., with numerous inspections to other activities. Their work is now completed and the team disbanded.

Under the direction of Mr. B. D. Russell, four team members were retained in Washington, D.C. to develop the software control and technical direction supporting the ESSM program realignment. To effect an operational change and prove the feasibility of the plan, CWO R. E. Tucker and Mr. L. E. Tower established a prototype ESSM Base at the Long Beach Naval Shipyard. This base was established with the support of the Long Beach NSY under the direction of LCDR E. Borden, and with management and technical direction of CAPT F. E. Dunhill, LBNSY Combat Systems Officer. In the original planning stages much support was gained from CAPT R. C. Fay, LBNSY Commander. The development of the ESSM prototype base was a cooperative effort by the Supervisor of Salvage and the Commander of the Long Beach Naval Shipyard. Both were interested in the streamlined ESSM program and supported it vigorously. Based on the LBNSY ESSM prototype base, now complete and without deficiencies, all other bases shall be established in the same pattern.

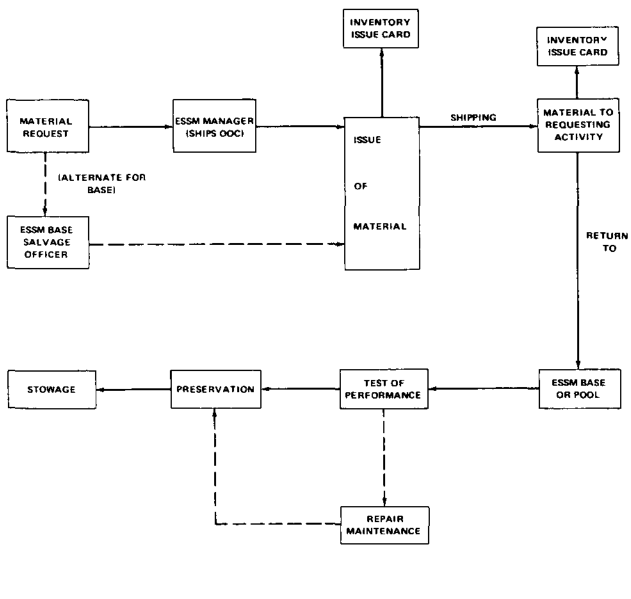
On request the equipment is activated, tested, and issued; on completion of operations the unit is returned to the base, tested and preserved for future requirements. Supporting the bases are two pools located in Oakland, Calif. and Bayonne, N.J.; the pool allowance is several times that of the base and includes some necessary, but rarely used, salvage equipment. Pools perform certain maintenance functions in support of the base operations.

Incorporated in the streamlined ESSM system is material used for a wide variety of projects sponsored by the Supervisor of Salvage; he has responsibilities in ship salvage, deep ocean object recovery, pollution control, submarine salvage, and a wide variety of ocean engineering projects.

To disseminate information on the streamlined ESSM system a NAVSHIPS manual, *Emergency Ship Salvage Material Manual,* NAVSHIPS 0994-012-4010, has been prepared and will be distributed in the near future. A new instruction detailing the realigned ESSM program, and specifying the responsibilities of ship salvage activities, is currently in preparation.

The inventory, management, supply, and funding of ESSM material is controlled by the ESSM Manager (Ships OOC-SO41).

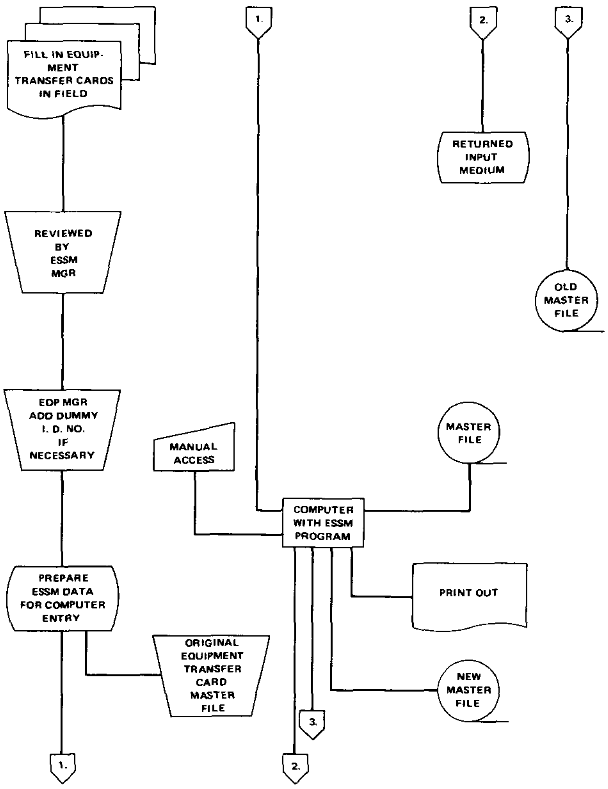
ESSM ACTION GUIDE

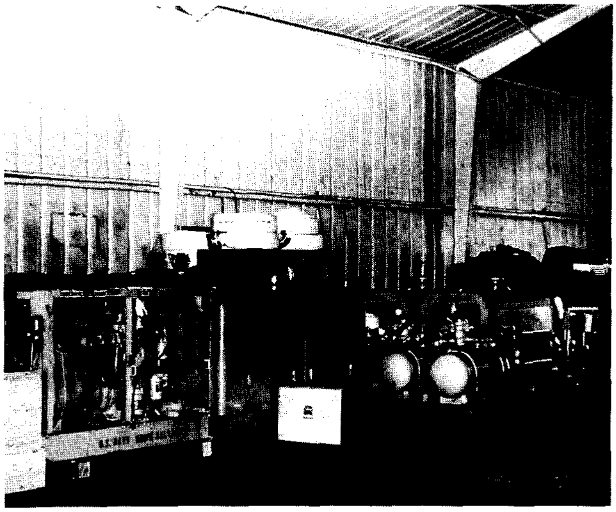


Equipment will be maintained in 16 ESSM bases, on a worldwide distribution, in light preservation and ready for issue. The following items are carried in all ESSM bases:

ESSM Catalog Item No.	Item Description	Allowance No. of Units
P0001	Beach gear, sets	4
P0010	Winch, beach gear, diesel	2
P0201	Pump, 3-inch diesel	6
P0210	Pump, 6-inch diesel	4
P0220	Pump, 10-inch diesel	2
P0240	Pump, 4-inch diesel	5
P0301	Compressor, 3.5 CFM, HP, diesel	1
P0310	Compressor, 125 CFM, diesel	3
P0313	Reserve air supply tank for diving	3
P0401	Generator, 5KW, AC, diesel	4
P0410	Generator, 30KW, AC, diesel	2
P0440	Lighting kit	2
P0470	Welder, 400 amp, diesel	1
P0472	Welding kit	1
P0901	Oil, preservative MIL-L-21260, grade 30, per drum	1
P0902	Oil, preservative, MIL-L-21260, grade 10, per drum	1

ESSM SYSTEM FLOW DIAGRAM





Pumps and machinery are ready for emergency use in ESSM stowage area. Welders, beach gear, and generators are a few of the items available for salvage operations in need of additional equipment.

Inventory control is maintained with the assistance of a computer program; the system is extremely simple and requires little effort to check the inventory, fill out a transfer card, or check the inventory against on-site assets for verification.

The heart of the system is the issue card; it asks the following information: date of issue, issue from, issue to, item issued and number. The ESSM coding system is used to designate all items and locations; if these cannot be located in the catalog (such as foreign flag ships or certain stations) they may be entered in plain language.

On the basis of inventory verification, and the updating as received from the issue cards, a computer printout is generated every quarter. A typical printout is shown; all items detailed are identified. This particular printout is for the ESSM base located at the Long Beach Naval Shipyard (location Code Number 60258).

The ESSM Manager, located in the Office of the Supervisor of Salvage, maintains current inventory printout and can, as may be necessary, obtain an up-to-the-hour printout. The inventory is made available to ship salvage activities and ships on a quarterly basis; more frequent and current inventories may be solicited as may be required. In addition to the printout shown, the computer sorts information, and develops totals.

The ESSM Manager receives computer summaries of the dollar value of units, total number of units and their various locations, a listing of allowance and deficiency in totals, and a cost to bring up the system to allowance.

Planning for future requirements and the necessary budgetary plans is greatly assisted by this information.

For issue and inventory control, items in the ESSM Systems are allocated letter cogs in accordance with their individual distribution; the following letter cog system is assigned:

Cog Letter	Material System
P	Pool and Base Units
Q	System Excess Material
R	Pool Spares
S	Submarine Salvage Material
T	Special Pools
X	Ocean Engineering Material
Y	National Emergency Contingency Material

Further breakdown of material systems, in each cog, may be made by noting the following distribution of units:

Numerical Series	Type of Equipment
0001-0100	Rigging
0101-0200	Line, wire, fittings
0201-0300	Pumps
0301-0400	Air compressors
0401-0500	Electrical
0501-0600	Tools
0701-0800	Oil Pollution Material
0901-1000	Miscellaneous Material

A cog letter precedes each numerical series. For example, P0001 designates a pool/base item and the numerical series indicates rigging; in the ESSM System P0001 is one set of beach gear.

Items, within a letter cog system and numerical designation, may be found in the ESSM Catalog, Chapter 3, of the NAVSHIPS *Emergency Ship Salvage Material Manual,* 0994-012-4010; each item is described and components detailed.

Ships and stations may use the ESSM inventory as a shopping list for material that may be required; stations holding the material listed are asked to verify the inventory to assure accuracy of computer printout.

It is extremely important that all members of the diving and ship salvage community follow the simple requirements of the ESSM inventory control system; only such interest may make this a streamlined effective material system.

Ship salvage operations, and a wide variety of other ocean engineering projects, will be performed faster and at lower cost as a result of the streamlined ESSM system.

For information or assistance in the ESSM system contact Mr. B. D. Russell, Code OOC-SO41, NAVSHIPS, Washington, D.C. 20360, by telephone [AUTOVON 222-1373 or commercial (202) 692-1373], message, or letter, depending on the urgency of the information required.

TYPICAL ESSM INVENTORY COMPUTER PRINT OUT

DATE OF PRINT OUT

PAGE NUMBER

EMERGENCY SHIP SALVAGE MATERIAL (ESSM)

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ESSM ITEM NUMBER	DESCRIPTION	LOC CODE	READY FOR ISSUE	NOT READY FOR ISSUE	ALLOW	UNIT COST	ALLOW DEF	ALLOW DEF COST
P0001	BEACH-GEAR-SET	60258	4	0	4	31022	0	0
P0010	WNCH-ST-CLY-DSL	60258	2	0	2	11950	0	0
P0201	PUMP-3INDSL-BAR	60258	6	0	6	1124	0	0
P0210	PUMP-6INDSL-BAR	60258	4	0	4	2500	0	0
P0220	PUMP-10"DSL-BAR	60258	2	0	2	3135	0	0
P0240	PUMP-4IN-ELEC	60258	5	0	5	3200	0	0
P0301	AC-4CFM-3000PSI	60258	1	0	1	2155	0	0
P0310	AC-125-DSL-ISRN	60258	3	0	3	4840	0	0
P0401	GEN-5KW-ONANDSL	60258	4	0	4	2157	0	0
P0410	GEN-30KW-DSL	60258	2	0	2	8901	0	0
P0440	KIT-LIGHTING	60258	2	0	2	300	0	0
P0470	WLDER-LIBBY-DSL	60258	1	0	1	4027	0	0
P0472	KIT-WELDING	60258	1	0	1	300	0	0

COST TO BRING UP ALLOWANCE

ESSM NUMBER ASSIGNED IN THE CATALOG

BRIEF ITEM DESCRIPTION

DESIGNATED LOCATION NUMBER 60258 IS FOR LONG BEACH NSY

NUMBER OF UNITS READY FOR ISSUE

NUMBER OF UNITS NOT READY FOR ISSUE

ALLOWANCE FOR THIS LOCATION

ALLOWANCE DEFICIENCY

museum feature: man in the sea

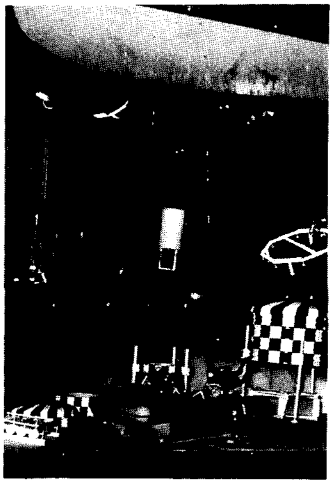
Any sailor's list of "things to do in San Diego" should include a visit to the Museum of Man, where an exhibit called "Man in the Sea" is currently on display.

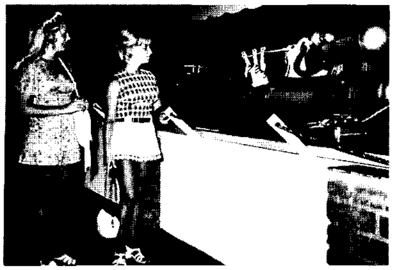
The exhibit traces man's ventures beneath the sea, from the first primitive gear available, to the sophisticated equipment of today which even Augustus Siebe, inventor of the original diving helmet, would never recognize. Other exhibits on view show man's use of the oceans from early historical developments in navigation, map making, and shipbuilding, through modern diving equipment such as submersibles, underwater habitats, and diver construction. Also included is a look into tomorrow, where underwater habitats may resemble your local Holiday Inn.

Situated in a large room resembling an old Spanish mission, with the vaulted ceiling reaching at least two stories, are display cases full of divers' everyday work clothes. To visitors, however, it is an underwater wonderland. Diving paraphernalia fill the display cases; sea shells, coral jewelry, a fantasy helmet worn in the Disney production of "20,000 Leagues Under the Sea," and the sophisticated Mark X are enjoyed by viewers.

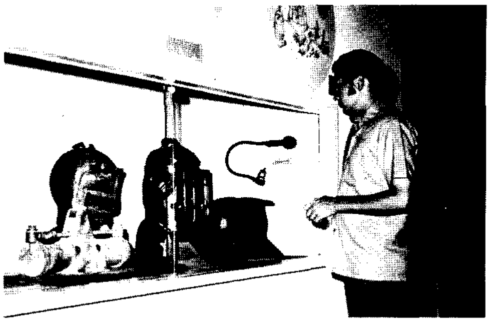
While recordings of underwater sounds fill the room, two-sided glass cases show visitors how grappling is done from the USS GEAR. Cut-away models of SEA LAB III, the Mark I DDS, the Tektite habitat, and DSV's such as TURTLE, TRIESTE II and the Cable Controlled Underwater Research Vehicle, CURV II, pose behind glass cases.

Equipment for the showing was borrowed from several Navy diving groups including Submarine Development Group One, Naval Undersea Research and Development Center, NCEL and the Naval Special Warfare Group in Coronado. Technical assistance was provided by LCDR Donald T. Blake from the SUBDEVGRU in San Diego.

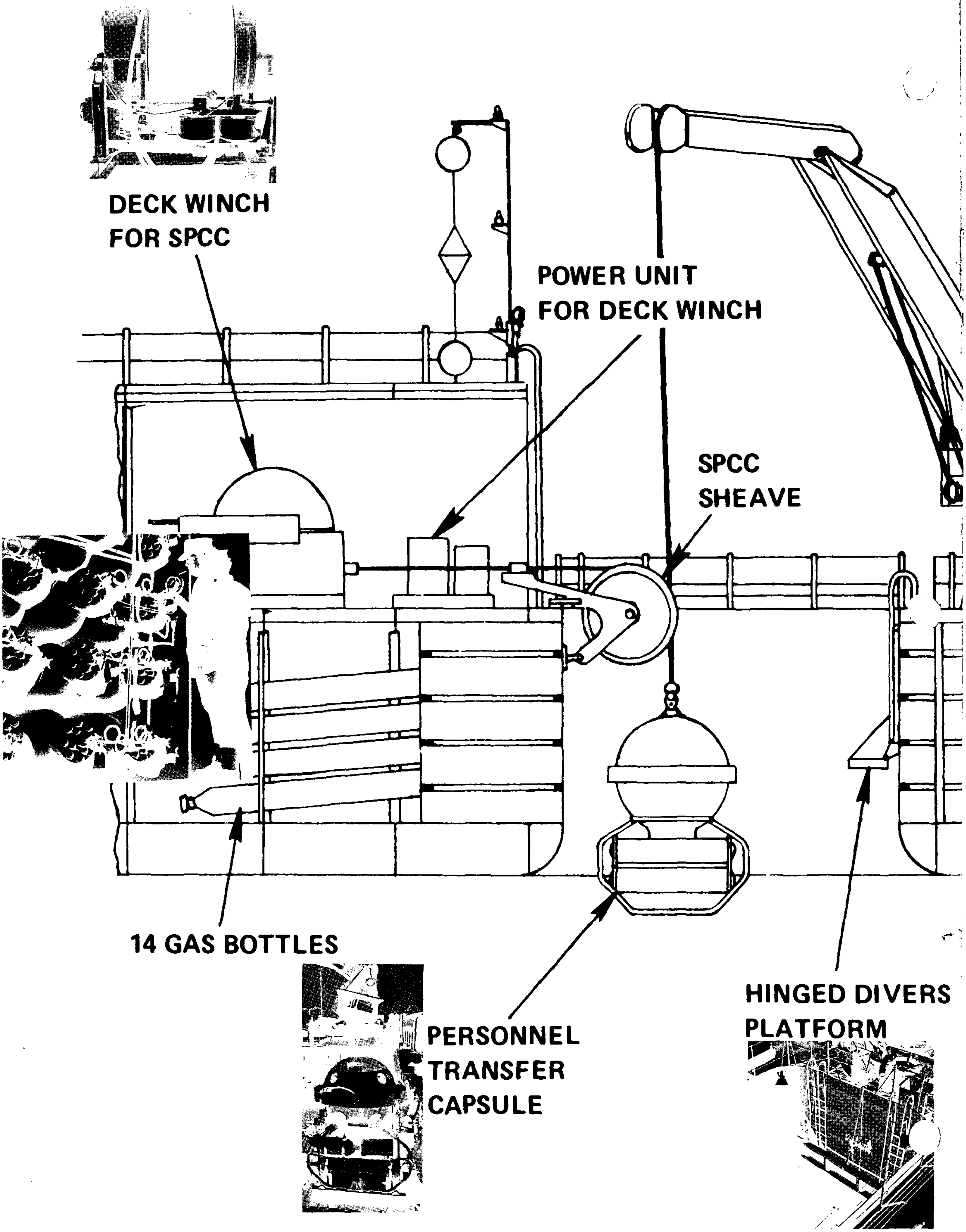


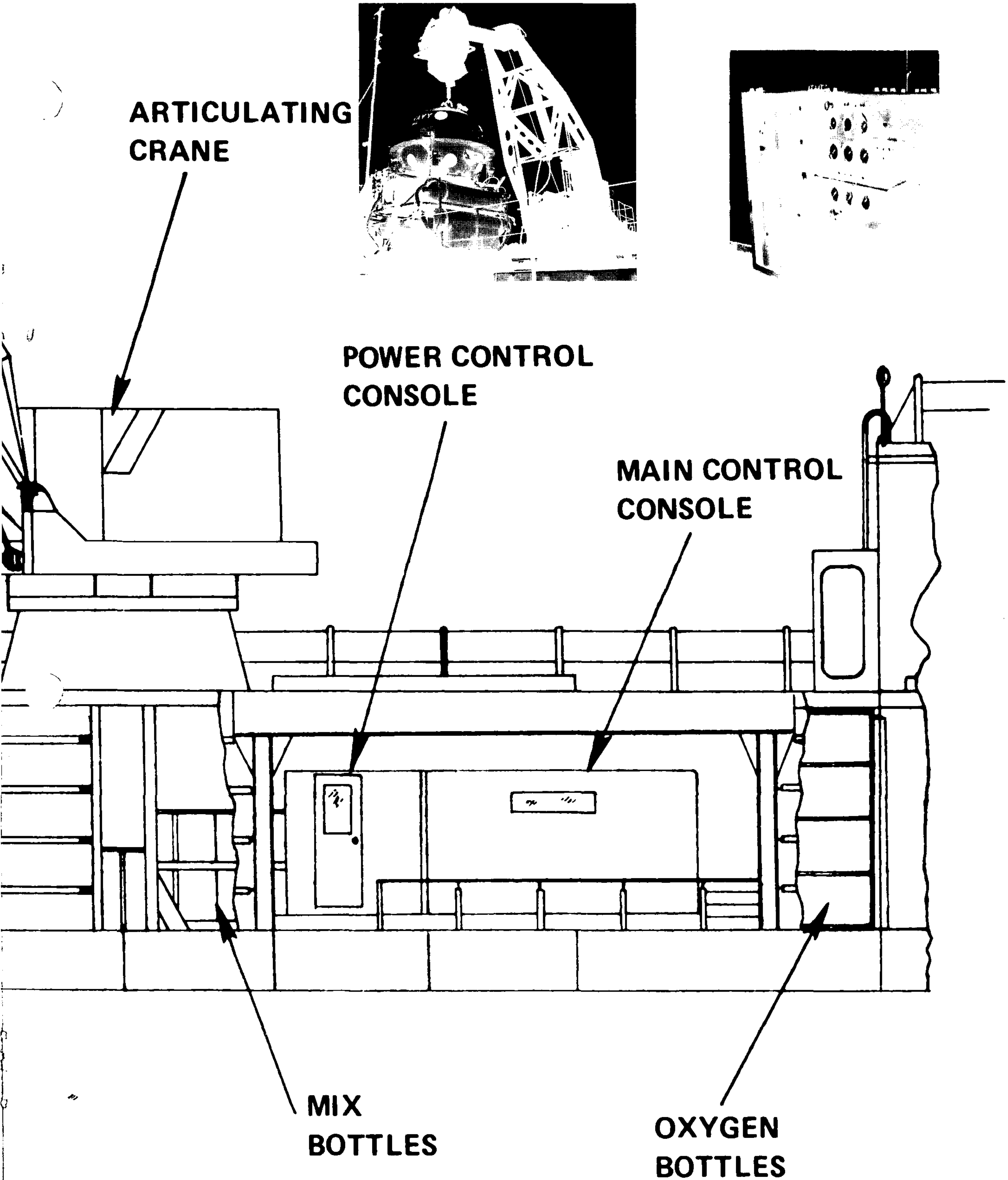


From left above: Display case shows models of designs perfected by NCEL. Checkered apparatus is an underwater habitat assembled in sections beneath the surface. Vehicle in foreground is a CAV (Construction Assistance Vehicle) designed to aid divers in construction work in the ocean bed (see FACEPLATE, winter 1970). In center photo, two young lovelies learn more about the sea and the men who work in it while checking out the Pegasus, a swimmer delivery vehicle.



From left: Evolution of diving helmets is shown in this display. Hand-operated air compressor is shown in foreground. Right, grappling for an article lost on the bottom is demonstrated in this two-way glass case.


DECK WINCH FOR SPCC
POWER UNIT FOR DECK WINCH
SPCC SHEAVE
14 GAS BOTTLES
PERSONNEL TRANSFER CAPSULE
HINGED DIVERS PLATFORM



FACEPLATE'S center pages this issue are devoted to a system unique in diving, a portable deep dive system installed on a barge. Of course the Mark I DDS has made news before, first by carrying divers to 850 feet during tests in 1970 and then by proving its air mobility this spring (see FACEPLATE, Summer 1971). Above, superimposed on a reproduction of a blueprint of the barge with Mark I installed, are photos picturing key areas. The YFNB-43 is currently undergoing tests at NSRDL, Panama City, Fla. Following that, it is headed for a permanent home with SERVLANT, Norfolk, Va.

a look at commercial diving

Although slightly undersized as divers go, five feet seven inches and 155 pounds, Ken Wallace effectively leads the 200 or more divers employed by Taylor Diving and Salvage Company, Belle Chasse, Louisiana, as seasonal and full-time divers. Wallace gave up regular diving and went into management at Taylor five years ago after finishing a 20-year career with the Navy. He managed the shift from former boatswain's mate to corporate executive with relative ease, largely aided by his personal friendship with Taylor's president, Mark Banjavich. The two men met in the Navy, and kept in touch after Banjavich, a shipfitter first class, left the Navy. Once out, he joined with two other diving buddies to begin what was to become one of the most successful undersea businesses in the U.S.

FACEPLATE recently visited with Ken Wallace to discuss commercial diving.

FACEPLATE: How involved is Taylor with saturation diving?

WALLACE: Saturation diving is barely coming into its own in the commercial salvage and diving business. Taylor is one of the most frequent users of saturation diving and yet it constitutes only three percent of our total diving business.

FACEPLATE: How extensively is Taylor set up for sat diving?

WALLACE: Since I came to Taylor, some five years ago, we have designed and built, in part since some of the fabrication is done on outside contracts, three saturation units; a fourth is under construction. All three are on active duty, one each in the Gulf of Mexico, the North Sea, and the most recent installation in the

Persian Gulf. (You might be interested to know that Taylor holds the record for the longest working saturation dive of 34 days. This took place this past winter while working in the North Sea using seven divers at 230 feet.)

FACEPLATE: Why are you such a strong proponent of saturation diving?

WALLACE: Your Navy readers are undoubtedly familiar with the positive aspects of saturation vs. conventional diving. Right now, for the Navy, saturation diving has only recently undergone strenuous testing, which means it is only just past the experimental stage. For commercial purposes, the main object is making a profit; Taylor has discovered, as has the Navy through their extensive testing, that divers can do more work, stay down for longer periods, and go down deeper, provided the job calls for those necessities. The most important thing to us, sat diving costs less money than any other method.

FACEPLATE: With the new oil finds off the Norway coast, what has been Taylor's role in bringing in that oil and how much of a part does saturation play?

WALLACE: To provide some history on this find, the Ekofisk field was discovered in November when a penetration was made in a 700-foot section of highly porous Danian limestone saturated with hydrocarbons. The magnitude of the discovery was proved in a few months and current estimates indicate that the field has over a billion bbls of recoverable reserves. Taylor's main job has been to lay a specially designed 44-ton base plate and a riser pipe caisson which rests on the seafloor and forms a base for flowlines between the rig's legs. The caisson contains eight four-inch flowlines from the wells, the two 10-inch loading lines running to the mooring buoys and four hoses used to control the wellheads and downhole valves.

All our work was done using saturation techniques. Fourteen independent saturations were made.

FACEPLATE: What more needs to be done?

WALLACE: Norway is very adamant about getting the high quality oil from Ekofisk to her shores, a distance of some 168 miles. Since a 1,000-foot trench lies between the find and the Norway coast, the only feasible method is to transport it via oil tankers. This is being done. To explain the process a little further, let me add that in 1972 several permanent platforms will begin actual development work on the giant Ekofisk field. Right now Canam's ***Gulftide,*** a portable mobile rig, is being used as a temporary production platform. In 1972, 12 pipe platforms, each with 24 drilling slots, will be equipped with twin drilling rigs designed to work simultaneously. The platforms will be erected in 230-foot water in the vicinity of the *Gulftide.*

FACEPLATE: What percentage of Taylor divers are Navy trained?

WALLACE: I would say that roughly 20 percent of our divers have had Navy training. The switch from Navy diving to commercial is a tough adjustment; new nomenclature (see FACEPLATE, Fall 1970) and different techniques, to name only two of many problems. Most new divers spend at least a year, sometimes two, as tenders. That is not diving – nor is it diving pay. And the alleged big money is only a fairy tale. My advice is to stay in the Navy, work hard, learn all there is about diving, and appreciate the steady work. The chances for survival on the outside will be better.

Commercial diving techniques vary so drastically from the conservative Navy methods; that philosophy is a problem for many divers to overcome. The commercial field is very competitive, which forces diving companies to forsake the training type operations required by the Navy.

FACEPLATE: How much of your operation is devoted to research?

WALLACE: We have an immense capacity for research here. I can truthfully say that our hyperbaric facilities are bigger and better than any in the world. We are capable of carrying out multiple avenues of research, such as that which has been done for the Navy (see FACEPLATE, Spring 1971). This fall more Navy dives are scheduled to test equipment and endurance. Our facilities are also open to anyone who has research projects which call for capabilities such as ours.

While our deep research is carried out in our hyperbaric research complex, routine equipment checkout and testing is done in another chamber which has total life support, but only a 450-foot depth capability.

FACEPLATE: Could you describe some of the outstanding features of the hyperbaric research complex?

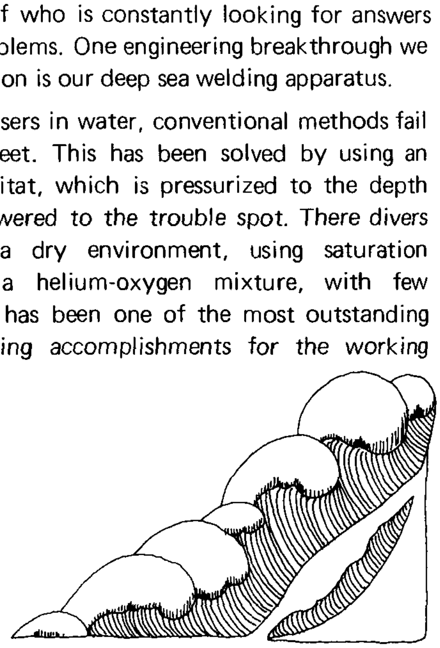
WALLACE: Briefly, it consists of three adjoining hyperbaric chambers containing four separate locks connected by pressure-proof doors. The largest of these units, referred to as the main vessel, stands vertically and has inside dimensions of 12 feet by 23 feet 6 inches. It is divided into a lower wet pot which is 13 feet 4 inches high and an upper igloo which is 8 feet 8 inches high.

The main vessel rises through both stories of the building which was literally constructed around the vessel after it and its ancillary parts had been assembled. Connected to the main vessel and positioned horizontally on the second floor is an annex chamber 7 feet in diameter and 12 feet 11 inches in length. An entry lock at the far end of the annex chamber consists of a 7-foot sphere. All four compartments are constructed to withstand depth pressures equal to 2,200 feet and will house up to eight divers.

FACEPLATE: Aside from diving research, is Taylor involved in any other research such as engineering or mechanical research?

WALLACE: Yes, definitely. We have a very capable engineering staff who is constantly looking for answers to unsolved problems. One engineering breakthrough we have capitalized on is our deep sea welding apparatus.

When welding risers in water, conventional methods fail at about 250 feet. This has been solved by using an underwater habitat, which is pressurized to the depth pressure and lowered to the trouble spot. There divers can work in a dry environment, using saturation methods and a helium-oxygen mixture, with few problems. This has been one of the most outstanding recent engineering accomplishments for the working diver.



A Summer Full of Training

Above, PT begins each day for EDs at Key West. Second photo shows class work which includes lectures and lab work. Instructor explains single hose regulator students will use on upcoming dive. Pool training includes clearing of facemasks, buddy breathing, bottom foot and 100 foot surface swims with SCUBA gear. In bottom photo, buoys are attached to divers during dives at sea. Divers come into shore after having a look at coral reefs off Key West.

Salvage training comes in many forms. One form especially for Engineering Duty Officers, or EDs as they are called, is offered by the Supervisor of Salvage during the Summer.

The program comes in three stages. During the 1971 course, the first part was a one week lecture series at the Supervisor of Salvage Offices in Washington, D. C. Several diving and salvage authorities, and legal specialists, both civilian and military, spoke to the class. Topics such as the LOSS Program, Equipment Development and Underwater Construction were supplemented with movies and class discussion.

From SUPSALV, the class, consisting of nineteen including junior officers, midshipmen, and civilians, then went to the Deep Sea Diving School in Washington for regular hard hat training. While this course normally takes 12 weeks, the EDs are pushed through in only eight. The course includes basic information concerning physics, diving medicine, work with underwater tools, salvage seamanship and a one week salvage project. This involves the survey, patching, and rigging of pumps in a sunken vessel.

From Washington, the class then traveled to the final phase in Key West, Fla. The physical demands which are made there may be a test for some who need a little muscle toning. But diving in the clear Florida waters usually takes a swimmers mind off his aching muscles.

At the Underwater Swim School in Key West, where SEALS, EODS, and UDT divers get their training, the EDs take their SCUBA training. There, basic studies in the equipment, classroom reviews of medicine and physics,and a strenuous physical training program which includes a one hour workout at 7:00 a.m. each morning keep students busy for three weeks.

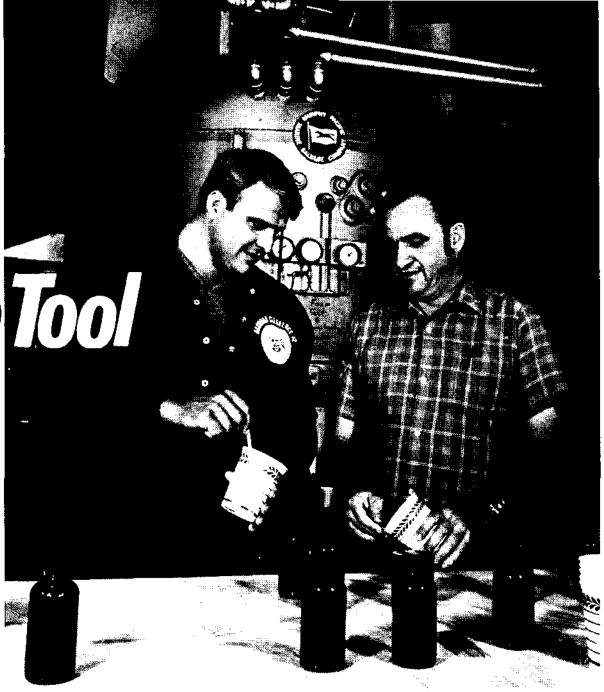
Pool training which incorporates training such as ditch and don, buddy breathing, and underwater harassment is soon left for actual dives off the Florida Keys.

According to LCDR P. Badger, CO, "this is the phase where our location is a definite advantage. Men who are apprehensive about underwater swimming soon forget their fears when they get a look at the beauty which surrounds them on the bottom."

This year an additional feature is being offered after graduation from the Underwater Swim School. The entire class will view a salvage operation now underway in the Panama Canal.

Further information on the Engineering Duty Officers Summer Salvage Course can be obtained from the Office of the Director of Diving, Salvage, and Ocean Engineering, Naval Ship Systems Command, Washington, D. C. 20360.

Foam Is Useful Salvage Tool



Students prepare polyurthane foam samples in the laboratory. From left, QM2(DV) Richard E. Filpi of HCU-2 and LCDR D. C. Joerres, CO HCU-1.

Keeping Navy salvage personnel abreast of recent technology in salvage is a constant task of the Supervisor of Salvage. One of the more recent additions to the salvage master's "bag of tricks" is the use of plastic polyurethane foam to produce buoyancy and strengthen damaged ships.

The first research concerning polyurethane foam was supported by the Navy in 1964 and 1965. In 1965 the Navy also completed the most spectacular salvage job to date using polyurethane foam, when the badly damaged destroyer FRANK KNOX was successfully removed from Pratus Reef in the South China Sea.

The Supervisor of Salvage, CAPT E. B. Mitchell, has consistently supported this research effort and the amount of knowledge and the quality of the foam equipment is steadily improving.

During the past three years the expertise in the use of polyurethane foam as a salvage tool has been available to the Navy personnel in a West Coast School conducted by the Murphy Pacific Marine Salvage Co. at Emeryville, California, for the Supervisor of Salvage. As the knowledge from research and practical use of foam as a salvage tool has evolved, the content of the instruction has been adjusted and new specialized courses will be offered to Navy personnel during the coming year.

The instruction presently offered covers the areas of foam in salvage and the problems involved in fighting oil pollution.

Students are introduced to polyurethane foam and how it is prepared by laboratory work and lectures. Small samples of various foams are prepared from liquid materials in the laboratory and the possible problems associated with preparation of foam underwater and at a salvage operation are explained and demonstrated, and at the same time the equipment and methods used to test various foam formulations for salvage are displayed. Instruction in safety procedures on the job, and the hazards associated with various equipment, are discussed in detail.

There are three main equipments – one, an aerosol system, whereby small tanks of foam-creating chemicals are charged with nitrogen and the chemicals blown through a mixing nozzle at shallow depths to form a rigid foam which displaces the water in a flooded compartment. Another system used large tanks of 10 or 20 thousand pound capacity to perform the same operation. Finally, the Navy has a mechanical foam-making machine, using positive displacement pumps, automatic blenders and heating equipment for use in very deep or very cold water.

Another, and main, section of the course is devoted to salvage engineering and how foam can be profitably employed as a salvage tool. Foam is usually applied to produce buoyancy but it may also be used for additional righting moment, to prevent flooding after a ship has been pulled free, or to offer additional strength to a damaged ship. Methods of sealing badly holed compartments with foam and designing foam applications for structural purposes are discussed, and instruction in the use of foam in conjunction with other methods of salvage in relation to both sunken and stranded ships is given.

A short indoctrination in the most recent developments in oil pollution is given. During the last few years great emphasis has been placed on control of environmental pollution, and the technology and data concerning oil

Foam in Salvage, cont'd.

pollution on the environment has expanded at an increasing rate. The Supervisor of Salvage has responsibility in this area, and has consequently developed equipment and technical data for oil pollution control which can be used for combating government or commercial oil spills. This equipment and its deployment around the country is discussed, along with new methods which have been developed or are now in the experimental stage.

Through this course, offered by the Supervisor of Salvage, salvage personnel are kept up to date in new technology, research, and equipment as it is developed for salvage, and oil pollution.

Above, polyurethane foam-filled drum after foaming. Technician John Nuyten holds foam gun. At right, divers DC 1 Johnny D. Pitscheneder, USS OPPORTUNE (ARS 41) and Richard Filppi prepare to install foam in submerged, inverted 55-gallon drum. Tending the divers are BM2 Billy G. Farris, HCU-2; ENS James M. Chase, USS CURRENT (ARS 22); BM1 Joseph E. La Croix and BM1 Jon L. Walter, both from USS GRAPPLE (ARS 7). DCCS Charles R. Flynn of the Safety Center, Norfolk, Virginia, looks on.

Divers Form Association

Just prior to Labor Day, 1970, a group of San Diego area divers began making plans for a "get-together" for the weekend. The picnic was a grand success with over 500 divers attending, both active and retired, with their wives and children. All agreed that such a successful venture should become an annual event.

It was then that the U.S. Navy Divers Association was begun. Ninety-four divers joined initially, elections were held, and the organization was underway. The following members were elected to office: M. S. Hill, President; D. Debolt, Vice President; H. L. Hicks, Secretary/Treasurer; A. Wigdahl, M. P. Cato, J. F. Breslin, and G. F. Boone, Board of Governors. All but Breslin and Boone are presently on active duty.

What was intended originally to be a purely social organization has since become beneficial to the San Diego community. Association members helped out during the serious fires in southern California last year, as well as donating blood and working for other charitable causes. According to Hill, Association President, "the N.D.A. has given divers a means of helping their fellow man."

Another feature of the association is their periodic newsletter circulated to all members. It passes the word, on a strictly unofficial level, about diving happenings around the world. New methods, equipment, and other noteworthy items such as diver assignments, pay bills, etc. are discussed. The newsletter has also published a complete list of members and their current addresses. This has proved to be helpful in enabling members to contact old friends and shipmates.

In the first year, membership grew to over 600 members scattered from the Mediterranean to the Tonkin Gulf. The membership includes, and holds in equally high esteem, the Supervisor of Salvage and a very recent graduate of the Second Class Diving School.

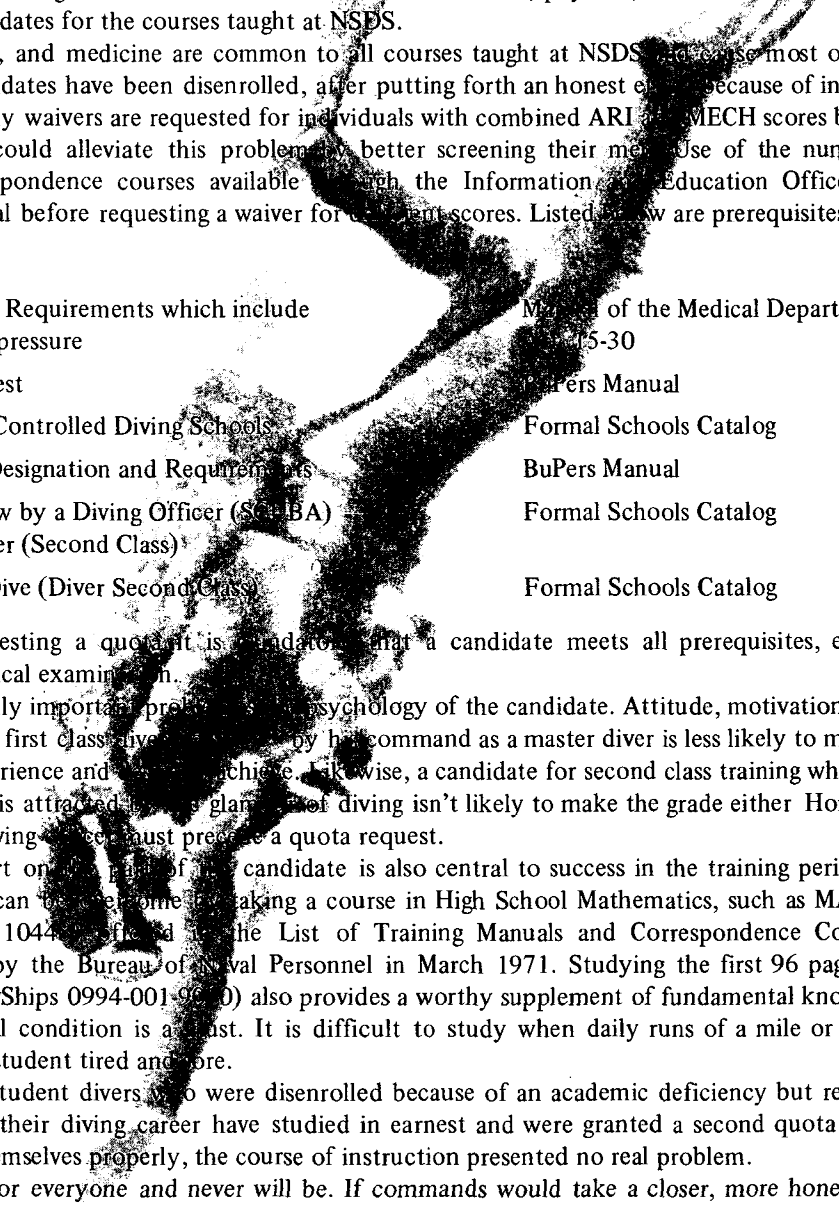
This September divers again converged at San Diego. This time there was a four-day convention. Included on the agenda was a divers' symposium, dinner and dance, and the second annual divers' picnic.

The Navy Divers Association is a non-profit organization, chartered in the state of California with plans for many branch charters. It is hoped that membership will eventually include all Navy divers, both active and retired.

Any personnel interested in the N.D.A. are invited to write:

U.S. Navy Divers Association
P.O. Box 6176
San Diego, Calif. 92106

Divers Need 3R's To Make NSDS



Since the early 1800's the breed of man who dons the rig of the working diver has been unique. He has been tough, resourceful, intelligent and unshaken by the psychic implications of the cold, damp, dark, and often lonely environment in which he must work.

The Naval School of Diving and Salvage in Washington, D. C. has the task of training and evaluating the men who join this select rank of divers. The school is proud of its rigid standards and the quality of its graduates speaks for itself. There are, however, a few areas where closer cooperation and communication with the various commands that supply diving candidates would save time, money, manhours, and possible personal embarrassment to some good sailors. These areas include academic, physical, and administrative screening and preparation of candidates for the courses taught at NSDS.

Math, physics, and medicine are common to all courses taught at NSDS [illegible] most of the academic failures. Many candidates have been disenrolled, after putting forth an honest e[illegible]ecause of insufficient basic education. Too many waivers are requested for individuals with combined ARI [illegible] MECH scores below 105. The parent commands could alleviate this problem [illegible] better screening their m[illegible]. Use of the numerous training manuals and correspondence courses available [illegible] the Information [illegible] Education Office would better prepare an individual before requesting a waiver for [illegible] scores. Listed [illegible]w are prerequisites for NSDS and their references.

Physical Requirements which include O_2 and pressure	M[illegible] of the Medical Department, [illegible]5-30
Swim Test	[illegible]ers Manual
BuPers Controlled Diving Schools	Formal Schools Catalog
Divers Designation and Requ[illegible]	BuPers Manual
Interview by a Diving Officer (S[illegible]BA) and Diver (Second Class)	Formal Schools Catalog
Initial Dive (Diver Second Class)	Formal Schools Catalog

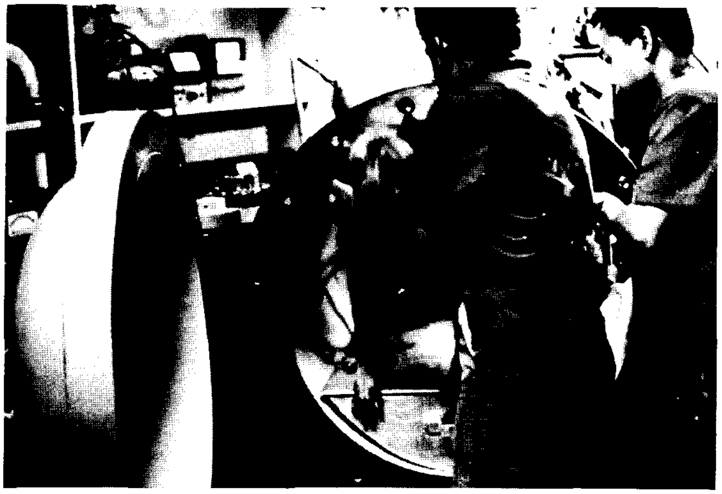
Prior to requesting a quota it is [illegible] a candidate meets all prerequisites, especially those concerning his physical exami[illegible]n.

Another equally import[illegible] psychology of the candidate. Attitude, motivation, and desire are critical in diving. A first class [illegible] by h[illegible] command as a master diver is less likely to make it than one who has broad experience and [illegible]chie[illegible]. Likewise, a candidate for second class training who really doesn't like the water, but is attra[illegible] gla[illegible] diving isn't likely to make the grade either Honest evaluation, therefore, by the diving [illegible] must prec[illegible] a quota request.

Personal effort on [illegible] f [illegible] candidate is also central to success in the training period at NSDS. A weakness in math can [illegible] taking a course in High School Mathematics, such as MATHEMATICS, PART I (NavPers 104[illegible] [illegible] the List of Training Manuals and Correspondence Courses (NavPers 18061-AE) issued by the Bureau of [illegible]val Personnel in March 1971. Studying the first 96 pages of the Navy Diving Manual (NavShips 0994-001-[illegible]) also provides a worthy supplement of fundamental knowledge. And of course, top physical condition is a [illegible]st. It is difficult to study when daily runs of a mile or so and a bit of calisthenics leave a student tired and [illegible]re.

In the past, student divers [illegible] were disenrolled because of an academic deficiency but retained a strong desire to continue their diving career have studied in earnest and were granted a second quota at a later date. Having prepared themselves properly, the course of instruction presented no real problem.

Diving isn't for everyone and never will be. If commands would take a closer, more honest look at their diving candidate, the chances of turning out an outstanding diver are excellent.



At left, HMC Buccat and HM1 Mandepat prepare to dive a dog in Surg-CDR Elliott's experiments on spinal cord bends. Below, HM1 Hernandez and Medical Ensign (working at NMRI on medical student summer program) prepare a hamster for X-rays to determine the degree of bubbling in the blood vessels.

this is NMRI

environmental stress division

Basic research is vital in any scientific discipline with diving certainly no exception. Possible hazards are more easily treated if they are found first in the lab, thus reducing the potential danger of the occupation.

At the Naval Medical Research Institute (NMRI), in Bethesda, Maryland, this preventive kind of research is accomplished in many areas. Under the direction of CDR Bob Hoke, MC, the Environmental Stress Division carries out basic research important to the entire diving community. Studies in physics, engineering, physiology, biochemistry, and microbiology are represented in the competent staff members. This, coupled with a wet pot and hyperbaric chambers of various sizes, enables NMRI to handle almost any basic research problem.

Experiments vary widely in scope and subject. While animals serve as primary laboratory subjects, many personnel assigned to NMRI are qualified divers and participate in experiments. Among the diving personnel are four diving officers, including a diving medical officer, retired Navy corpsmen and a retired Master Diver now working as civilians, with the remainder of the staff qualified in SCUBA. Dogs, cats, rats, and mice also enter chambers with instruments attached to their bodies to measure body functions and other data.

Surg-CDR David H. Elliott, an exchange officer from the Royal Navy and a world-renowned authority on hyperbaric medicine, is currently involved in experimentation using dogs as test subjects. His area of concern is the spinal cord "hits" in decompression sickness. He and his assistants have reached the point where the "hits" can be produced in the dogs fairly consistently. From this point, they will go on to find a way to avoid such "hits" in humans and to improve the treatment when they do occur.

The bioengineering lab at NMRI, with LT William Moritz, MSC, in charge, has developed a bioinstrumentation package with a 16-channel multiplexer which allows

transmission of 16 physiological variables over one wire. This package, a canister about 9 inches in diameter, is programmed through a computer topside to transmit complete information from a diver working at depth. Factors measured include EKG, from which heart rate is derived, core temperature, skin temperatures, respiratory rate, respiratory minute volume, oxygen tension, and depth of submergence.

The chambers at NMRI have other uses besides experimentation. An upcoming program of significance is the treatment of stroke patients

a. Mr. Wally Bent, Master Diver retired, supervises dive at NMRI complex. b. Lab technician performs biochemical test on blood drawn from experimentally decompressed animal. c. ETR3 Bawanco and LT Moritz monitor the physiological reactions of a diver in the chamber while wearing the 16-channel multiplexer designed at NMRI. d. HM3 Lucas and HM3 Ashburn observe rats during an experimental dive. e. Mike Allison (former HM2) prepares mice for hyperbaric oxygen exposure tests.

with hyperbaric oxygen under pressure. Two test groups will be used, one on oxygen, one on air, to observe group response to treatment. Patients suffering from carbon monoxide poisoning, cerebral vascular accidents, delayed wound healing, and chronic osteomyelitis have received treatment in NMRI's clinical chamber.

NMRI staff members work closely with those at the Experimental Diving Unit. Both groups were on hand during a recent study of respiratory heat loss in divers at simulated depths to 1,000 feet at the Unit. These studies were followed by cold water dives to 1,000 feet in 29° F water in the chamber of the Taylor Diving and Salvage Company in New Orlenas (FACEPLATE, Spring 1971). NMRI is now focusing attention on these two areas to determine the direct tissue damage in the respiratory tract from inhaling cold, dense gases.

NMRI has impressive hopes for the future. A new complex for environmental health effects has now been proposed. The new facilities would include a three-story building with over 30 individual laboratory spaces and adequate logistics space as well as a 1,000 psi chamber complex designed for deep dive simulation, capable of supporting divers to 2,000 feet. This latter facility would consist of an air lock, a treatment chamber, and a wet pot capable of chilling water temperatures to the freezing point. Eight 500 psi chambers would be available for toxicological studies of laboratory animals to depths of 1,000 feet.

These plans could adequately cover the increasing demand for biomedical research to support efforts in sending divers deeper and for longer periods of time. The studies done in the NMRI laboratory may become the basis for important discoveries to make life in the water safer and more productive.

letters

Gentlemen:

May I say what a pleasure it is to receive your splendid publication "Faceplate" and thus be kept informed about diving developments in the United States Navy and the personnel involved with them.

My other reason for writing is to tell you how delighted we all were to read that LCDR Jim Bladh had been awarded the Navy Commendation Medal (see FACEPLATE, Spring 1971). During Jim's tour of duty with the Royal Navy he spent a long time with us at the Deep Trials Unit where we valued his services immensely. He was, in our view, a true professional in every sense of the word and a wonderful shipmate in whom we had every confidence. His golf wasn't too hot but no doubt it will improve now that he isn't working so hard as he had to with us!!

Through your pages we would like to wish Jim every success for the future and may "Faceplate" long continue.

Yours faithfully,
Bill Filer, LCDR, RN
Officer in Charge
Deep Trials Unit

Gentlemen:

I feel that the Navy would benefit greatly by a consolidation of diving research facilities. Presently medical research is conducted at the Experimental Diving Unit, the Naval Medical Research Institute, the Submarine Medical Center, and at Submarine Development Group One in San Diego. The BUMED commands are hampered in their research programs by a lack of diver subjects and sufficient qualified supervisory personnel. The operational commands, EDU and SUBDEVGRU-1, have these facilities but are burdened by operational commitments, compromising basic research. If these facilities were combined, there would be sufficient medical personnel to meet the requirements of a basic research program as well as to support operations.

Sincerely,
C. J. Frank, M.D.
Beatrie, Fla.

Gentlemen:

I have noticed in my travels throughout the fleet Master Diver and Diving Officer breast insignias being worn by many personnel that I believe do not warrant wearing this device. While stationed at the U.S. Naval School, Deep Sea Diving, I understood that only current Master Divers could wear the silver breast insignia and Diving Officers of the NOC 9312, 9313, 9314, and 9375 could wear the gold breast insignia. Diving Officer NOC 9312 and 9313, newly graduated from school, would have to serve one year on board ship or have one year's experience involving diving, and be recommended by their commanding officer or next higher authority before being authorized to wear the gold breast insignia.

I would like to know what criteria is set down for eligible personnel to wear this popular breast insigina. If there is an instruction of a sort that deals with this insignia, please advise through FACEPLATE. If there are no criteria, it would be most advisable to publish some.

Sincerely,
Frank E. Eissing, Jr.
Master Chief Damage Controlman
Master Diver
Harbor Clearance Unit One

The following is an excerpt from the BUPERS Manual 1410400 which pertains to Chief Eissing's questions: Officers authorized to wear the Diving Officer Insignia are Diving Officer (General) (9312), Ship Salvage Operations Officer (9375). After one year of active supervision and when recommended by their commanding officer, are Deep Sea (HeO2) Diving Officer (9313) and Ship Salvage Diving Officer (9314).

Enlisted member who qualifies as a diver is authorized to wear the Insignia. Master divers are qualified to wear the Master Diver Insignia regardless of physical qualifications. ED.

"Are you the man reporting aboard from diving school?"

Through the years divers have developed new techniques for removing propellers under water in emergency situations, and in most instances these techniques have become standard procedure throughout the Navy. Explosives have become one of the common tools for removing propellers; perhaps unwisely. Even though there are few existing records of damage to any part of a ship where explosives were used carefully, there remains considerable risk of damage to the stern, thrust bearing, and struts near the propeller.

It is preferable to explore all other means of removing propellers before resorting to the use of explosives. When it is available, a propeller puller should be used rather than explosives. In those rare cases when the propeller puller will not do the job, explosives may be used supplementarily. In such a situation, the propeller puller is left in place with a heavy strain on it. The puller acts in conjunction with a small explosive charge, thus reducing the danger of damage. When using a primacord to jar the propeller loose, one complete turn around the shaft for each inch of diameter of the shaft will generally provide a satisfactory shock to move the propeller on shaft taper.

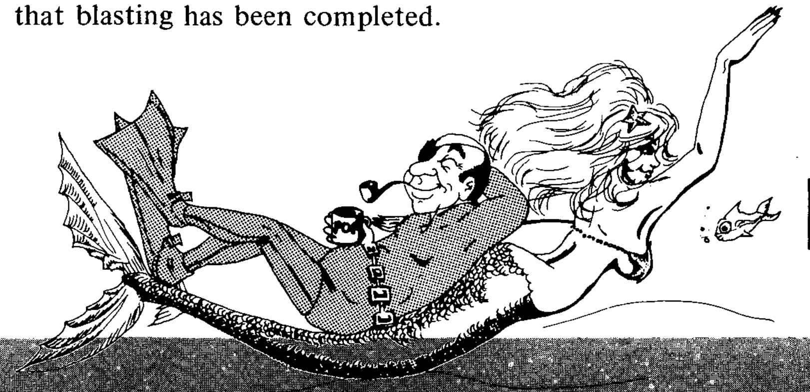
The primacord is secured to the shaft and the bitter end led to a small float on the surface where the electric blasting cap is attached. An alternative is to lower the blasting cap under the surface of the water. When all is clear and ready for blasting, the electric blasting cap leads are connected to the firing wire and the charge is detonated from the power source.

Explosives are extremely hazardous even under the most ideal conditions; thus, good judgment and adequate safety measures must always be exercised. A few safety precautions are listed below:

1. Assign one person responsibility for supervision.
2. Do not attempt to reclaim or use fuse, blasting caps or any explosives that have ever been water soaked.
3. Do not leave explosives unguarded; keep them under lock and key until needed.
4. Do not carry blasting caps in pockets of clothing.
5. Do not store blasting caps with other explosives.
6. Keep explosives away from flame, excessive heat, sparks, or impact.
7. Keep safety shunt in place until the cap is to be connected to a firing circuit.
8. Do not pull or exert any pressure on lead wires when removing cap from container.
9. Test entire circuit with a circuit tester (Galvanometer).

NOTE: Use only silver chloride cell with the circuit testers. A standard dry cell generates sufficient current to detonate electric blasting caps and must never be used in the circuit tester.

10. Notify the OOD prior to blasting and have the work passed over the IMC. This should allow shipboard personnel to prepare themselves or notify the diving supervisor to hold up on the shot.
11. Notify all ships' OOD's in the immediate vicinity that blasting is being conducted and that blasting has been completed.



THE OLD MASTER SAYS