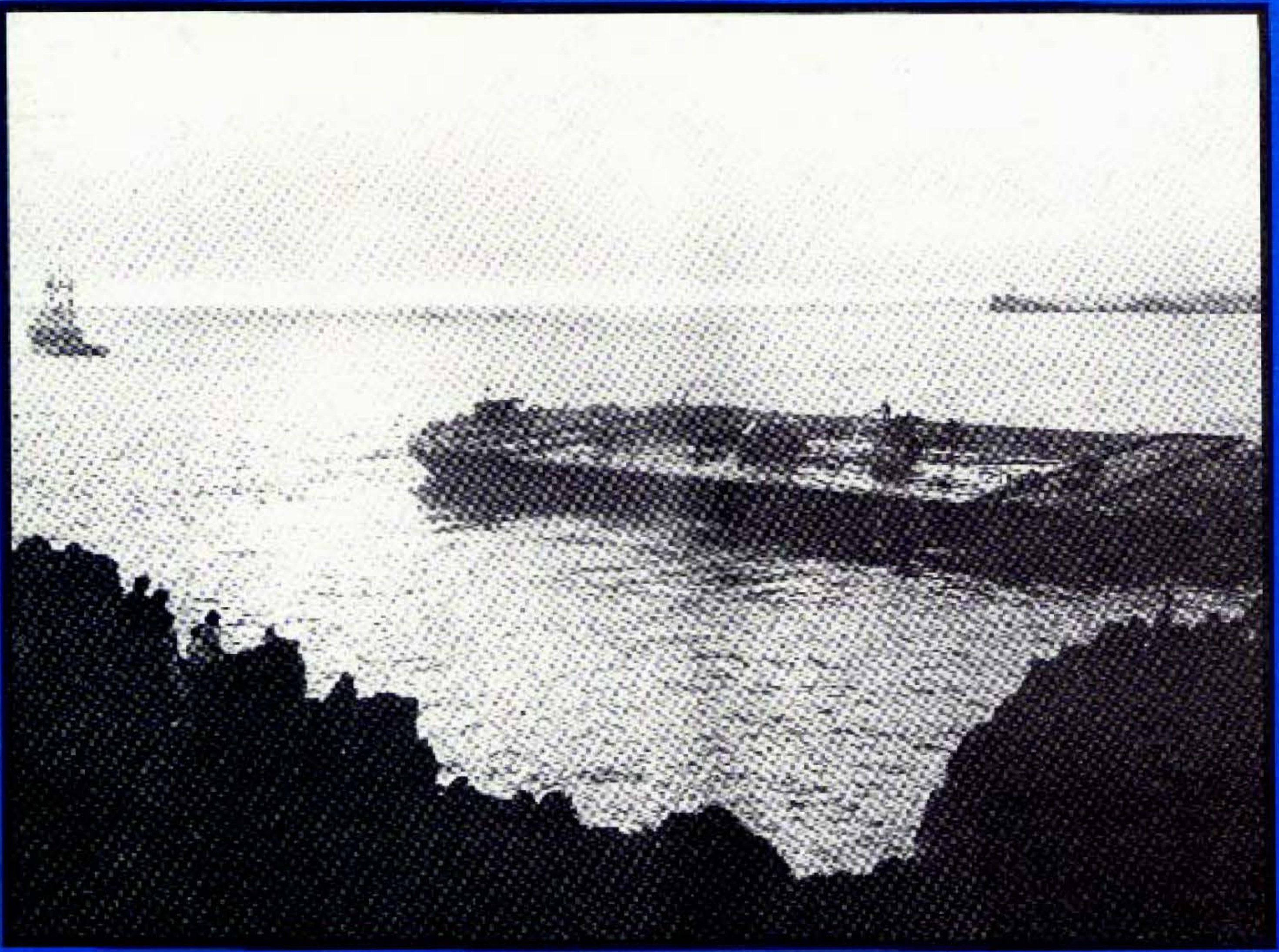
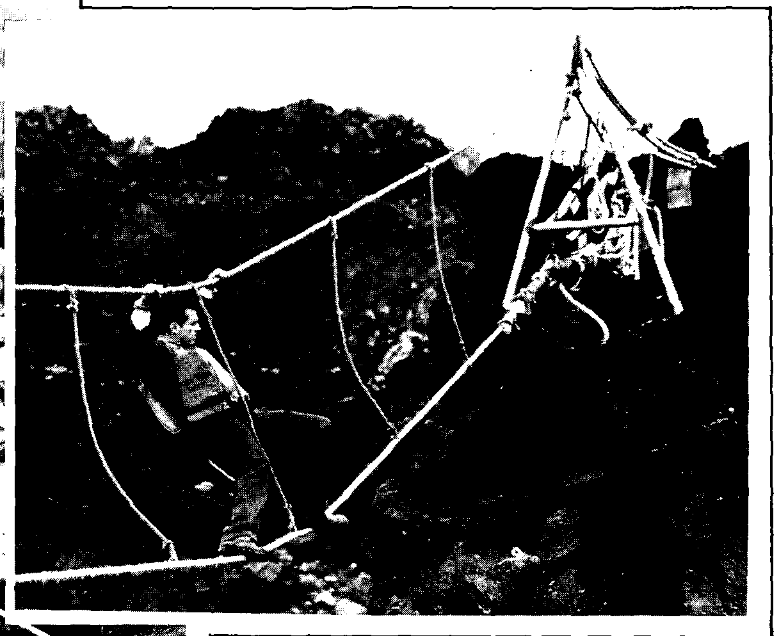
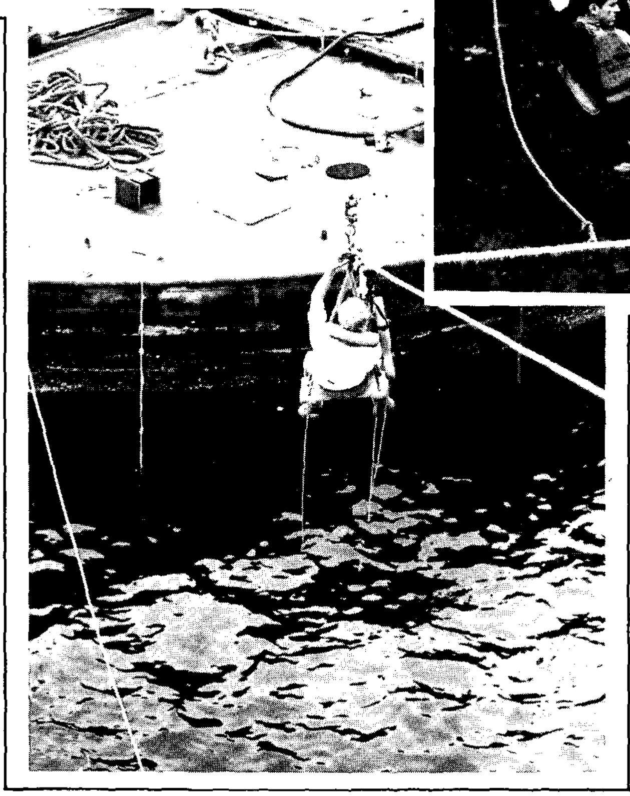


FACEPLATE

FALL 1981





Photos show various modes of transportation used to arrive at salvage site in Ponta Delgada.

FACEPLATE

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

VOLUME 12, NO. 3

Front cover: View of GOLF pontoon during AFDB-7 salvops (page 14).

Back cover: Inspection of new screw before waterborne change on USS ENGLAND (page 22).

FACEPLATE is published quarterly by the Supervisor of Diving to bring the latest and most informative news available to the Navy diving and salvage community. Articles are presented as information only, and should not be construed as regulations, orders, or directives. Discussions or illustrations of commercial products do not imply endorsement by the Supervisor of Diving or the U.S. Navy.

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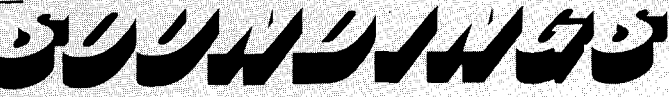
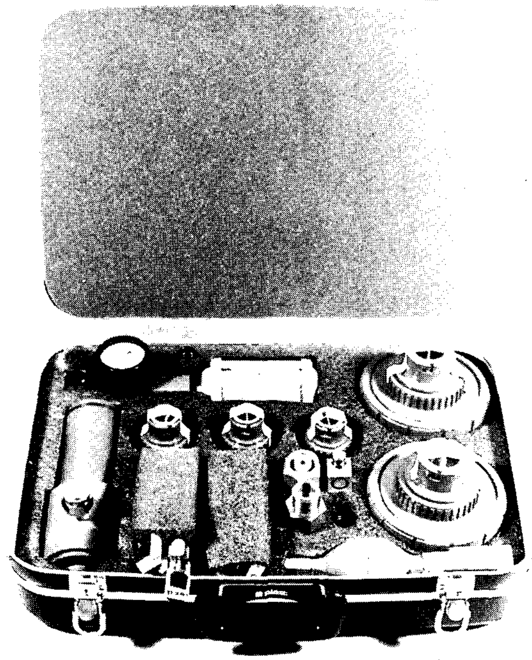


CDR Anderson



Air Sampling Kit

CDR ANDERSON RELIEVES CDR MACLIN

Effective 21 September 1981, CDR Richard Anderson relieved CDR Charles Maclin as Deputy Supervisor of Salvage, Naval Sea Systems Command (OOC).

CDR Anderson, a 1963 graduate of the U.S. Naval Academy, began his ED Salvage career in 1972 as the Diving and Salvage Officer at the Long Beach Naval Shipyard. There, he participated in many diving and salvage operations, including that of the Litton Launching Platform in Pascagoula, Mississippi. He then served 3 years in Naples, Italy, as Assistant Fleet Maintenance Officer and SIXTH Fleet Salvage Officer. During that tour, he worked with Fleet units on many operations, including ship and aircraft salvage, search and recovery, towing and underwater ship husbandry. Before reporting to NAVSEA, CDR Anderson was the P & E Superintendent at the Philadelphia Naval Shipyard, where he continued to work in the salvage area as that facility's Diving and Salvage Officer (participating in the AFDB 7 SALVOPS, Azores).

CDR Maclin has departed OOC for duty as Assistant Project Manager for ESSEX Class Ship Reactivation, within the Aircraft Carrier Ship Acquisition Project (PMS 392).

DIVER'S AIR SAMPLING

Wally Jenkins
Naval Coastal Systems Center

The Naval Sea Systems Command (NAVSEA) established a program for the mandatory sampling of diver's air sources in 1977, to ensure that the breathing air used by Navy divers is free of excess carbon dioxide (CO_2), carbon monoxide (CO), oil mist and particulates and other impurities (NAVSEA NOTE 9597). The program requires that an air sample be obtained semi-annually from every supply source of diver's breathing air in the U.S. Navy. Analyses are performed for every ship, shipyard, school, detachment, diving locker, submarine, etc. that possesses a diving capability. In addition, several U.S. Coast Guard, Marine and Naval Reserve users are covered. At present, the analyses are performed on a government contract by a qualified analytical laboratory, Texas Research Institute, Inc. (TRI) of Austin, Texas. The Program Administrator, the Naval Coastal Systems Center (NCSC), Panama City, Florida, is responsible for coordinating more than 2,000 analyses required by approximately 300 users, with the analytical capability of the TRI laboratory.

Ideally, each user receives an air sample kit from TRI during the month of their semi-annual due date. The kits are individually assembled to meet the specific needs of the user. They contain the required filters, orifices and sample bottles, as well as the adapters required for sampling each air source. Also included in each kit are concise instructions for taking a representative sample of a compressor system or air bank output. A detailed review of the air sample kits and sampling procedures is presented in the U.S. Navy Diving Manual, *Appendix M*. Upon receipt of the sample kit, a user will analyze each of his air sources and return the complete kit by priority mail (prepaid) to TRI within 3 days of receipt (or as soon as possible). At TRI the samples are analyzed for oxygen, carbon dioxide, methane, carbon monoxide, total hydrocarbons and oil mist and particulates. A computerized analytical report is sent to the user and a copy forwarded to NCSC for record purposes if the results are within the required specifications.

When a sample fails to meet one or more of the air purity standards established by the Bureau of Medicine and Surgery, TRI notifies NCSC immediately—who relays the information to the user activity via message or speedletter and, if possible, by telephone. The user is advised of the source from which the sample was taken and the readings obtained.

The large number of air sources which must be sampled or resampled because of overhaul, replacement, improper sampling technique or because of excessive impurities, etc., combine to produce a sampling schedule which requires continuous communication and cooperation between Fleet activities and NCSC, as well as between NCSC and TRI. Fleet users, NCSC and TRI work together to ensure that each source of a diver's breathing air is sampled on a semi-annual schedule. This is done by the prompt use and return of the sample kit by the user, expeditious sampling of returned kits as well as preparation and shipment of new kits by TRI and close monitoring by NCSC of the overall program. The number of users is constantly growing and is as diverse as the requirements for diving and diving support in the military community.

For further information and/or assistance in the diver's air analysis program, contact Mr. W. T. Jenkins, Code 712, Naval Coastal Systems Center, Panama City, Florida 32407, Commercial: (904) 234-4482, Autovon: 436-4482.

AN/PQS-2A PORTABLE OBJECT LOCATOR SONAR

The AN/PQS-2A sonar, developed by the U.S. Navy, has been Approved for Service Use. It is intended to be used by Explosive Ordnance Disposal (EOD) divers in locating submerged objects, including mines, misplaced equipment and downed aircraft. Constructed from non-magnetic components, it may be safely used in the vicinity of magnetic influence ordnance. The AN/PQS-2A is a Continuous Transmission Frequency Modulated (CTFM) sonar with an active mode for locating objects within 20-, 60- and 120-yard ranges and a passive listening mode for locating acoustic pingers up to 1,800 yards. A transducer, rechargeable battery and two custom hybrid integrated circuits are housed in a compact cylindrical polycarbonate housing with volume, active range, passive frequency adjustment controls and a headset. Production is planned for FY82, with initial deliveries during the summer of 1983.

PRESERVER MAKES SCENIC EAST COAST TRANSIT

From USS PRESERVER

During a 3-week time-frame, crewmembers aboard USS PRESERVER (ARS-8), under the command of LCDR William T. Bassett, USN, have managed to travel the east coast of the United States much like old U.S. Route 1, from tip to tip. Their assignments have taken them from Maine's Western Bay, just miles from the Canadian border, all the way south to Key West, Florida, and home again to Little Creek, Virginia.

Following successful completion of an aircraft salvage in Maine, PRESERVER journeyed toward home, shortcutting through the beautiful Cape Cod Canal in Massachusetts and stopping overnight in Newport, Rhode Island. After a week in homeport for crew rest and to restock supplies and material, PRESERVER continued south to Key West. While operating in the Straits of Florida, PRESERVER assisted in the shock testing of the USS KIDD (DDG-993). Acting as a support vessel for the many small craft involved and as standby vessel in the event services were required following each blast, PRESERVER's divers assisted in the positioning of explosive charges that were meticulously placed at the correct distances and dpeth to ensure the proper effect. In a message to PRESERVER crewmembers, KIDD's Commanding Officer signaled *Bravo Zulu* "for a singularly superb professional performance," commending them for "extraordinary skills of planning, innovation and seamanship . . . (in) adverse weather."

PRESERVER is a proud member of the salvage Navy, serving under the operational control of CAPT Robert H. Fred, Commander Service Squadron EIGHT. She is equipped with portable and installed pumps, winches, beach gear, diving equipment and a certified diver recompression chamber. In addition to providing services to the Fleet, PRESERVER has served the past 2 years in the Naval Reserve Fleet. Besides training members of her own reserve crew, PRESERVER acts as a training platform for reserve units of Harbor Clearance Unit TWO and for the COMNAVSURFLANT Diving School at Little Creek.

View from OOC

Colin M. Jones, CAPT, USN
Director of Ocean Engineering,
(Supervisor of Salvage & Diving)

I would like to again take the opportunity to bring you up to date on the study being conducted by the Marine Board of the National Academy of Science on the national salvage posture. This study continues to move along on schedule. It has occupied a great deal of my time and that of other key personnel on the staff here in OOC. At this juncture, it is a bit too early to predict what the outcome will be. However, I can assure you that the study will be a thorough, professional look at what our commercial salvage posture is in the United States.

This project was authorized by the Secretary of the Navy after a briefing I presented last year. It was precipitated by the reduction of Navy assets: we have reduced the number of salvage vessels in the active Fleet in recent years; consequently, our "presence" on both coasts is significantly smaller. My concern was further heightened by the demise of the Murphy Pacific Salvage Company. There are, fortunately, a number of salvage companies which are growing in size and capability. I am delighted to see this increased strength in the commercial sector. In addition to the posture of the Fred Devine Salvage Company and an increased interest in the salvage business by Tracor Marine, we have seen the formation of Ocean Salvors, a joint venture of Crowley Maritime and Moran Towing. This obviously brings to the salvage business the tremendous assets of these very large water transportation companies.

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On a worldwide basis, salvage posture is experiencing an economic decline similar to that seen in recent years in the United States. Many of the large European salvage companies have been selling their bigger tugs and removing a number of tugs from dedicated salvage stations. Thus, there are few dedicated salvage stations, manned as such, by any of the large European salvage companies. The French Government has undertaken to man three permanent salvage stations—two on the Atlantic Coast and one on the Mediterranean—to provide additional salvage capabilities. The British have determined that they are adequately protected by the commercial assets available in northern Europe. It is interesting to note that most of the large salvage and towing companies in Europe today are procuring tugs in the 9,000 shaft horsepower range.

Evolving in the salvage business worldwide is the increased reliance on the "itinerant tug." By this I mean relying on the use of whatever towing capability may be available in the area by flying aboard salvage machinery and personnel. This procedure has been the way of business in the United States for some time, and it has been performed in some areas with success. This practice is one of the major items that the current on-going Marine Board Study must evaluate, since it is becoming more common in Europe and elsewhere throughout the world. The economics of the salvage business continue to decline because of the size of awards and because of the increased liability and complexity created by new legislation involving pollution. This, coupled with rising fuel and labor costs, dictates a change in the way salvage companies operate.

Reliance on itinerant tugs, of course, presents a number of problems to the Salvor. First, the operator of a salvage ship is inclined to keep a new, or essentially new, tow wire on the ship at all times. This is not the common commercial practice with tugs used for towing. Consequently, the tow wire is apt to be in less than new condition and, therefore, is apt to have less than new tow wire strength. Second, the itinerant tug does not carry either the personnel or the equipment necessary to conduct salvage operations. Reliance is placed on the ability to fly such equipment to the ship by helicopter. The itinerant tug, naturally, has no shop facilities or repair capability. This is not particularly different, though, than many commercial salvage ships, since they do not as a rule carry the extensive shop and repair capabilities that we carry on our Navy salvage ships.

My interest in reviewing and monitoring this commercial salvage posture is to ensure that we are prepared in the event of all-out mobilization.

My interest in reviewing and monitoring this commercial salvage posture is to ensure that we are prepared in the event of all-out mobilization.

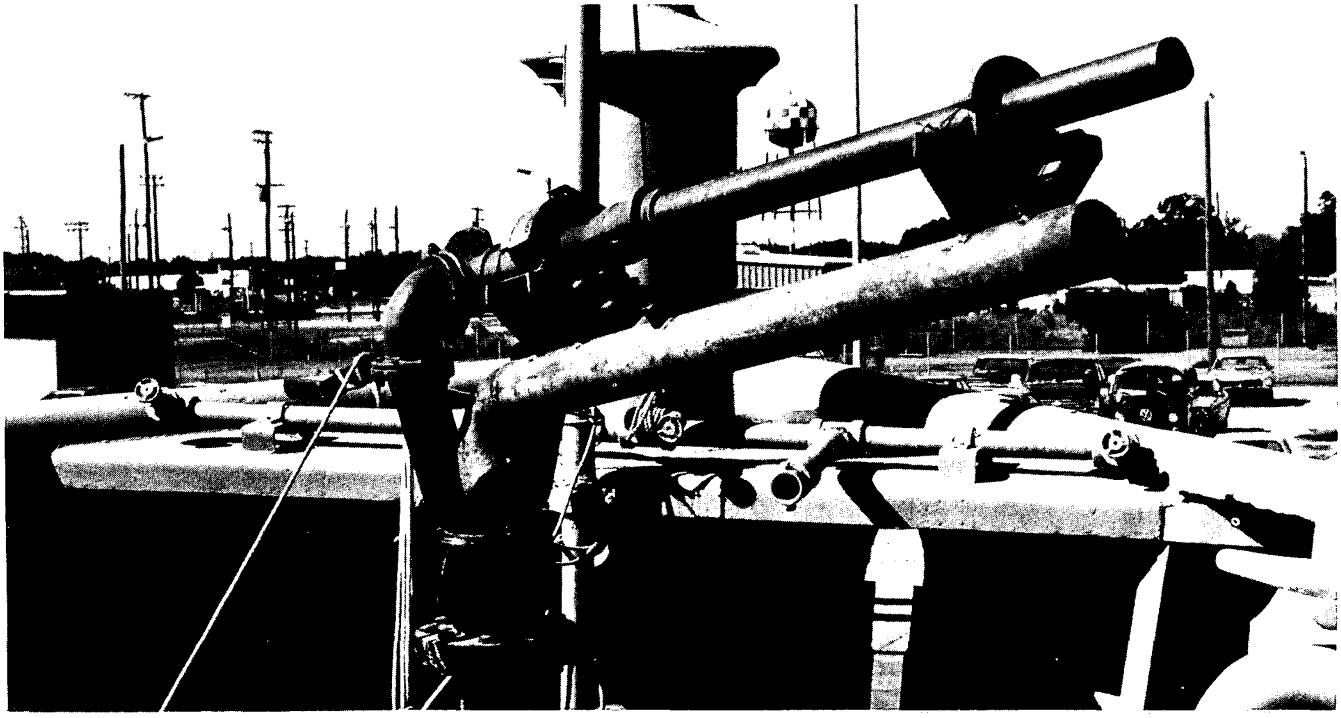
I would also like to take this opportunity to focus attention on the major differences between our salvage ships and commercial salvage ships. We are being criticized in many quarters for the size and complexity, as well as the attendant cost, of our Navy salvage ships. It is well that we all recognize that a Navy salvage ship is designed, and is called upon, to operate in an entirely different environment than a commercial salvage ship. We cannot expect to be able to rely on shore support. On the contrary, we must be prepared to operate in a hostile environment. This means that we must have as an integral part of our salvage ship the necessary diving capability, the salvage machinery, the shops, the repair material and the personnel to utilize all of these assets.

The commercial salvor would never dream of trying to fabricate complicated patches on board his salvage ship. He simply turns to a nearby shipyard and has them fabricated and then flown out to whereever necessary. We cannot rely on this practice. We must be prepared to operate 10,000 miles from home and 10,000 miles from any form of support. Certainly, this requirement to be totally self-contained and to operate far from home necessitates the great increase in the complexity of our salvage ships. We must be prepared to support diving operations around the clock, for months if necessary. We must be prepared to fabricate both steel and wooden patches of various sizes and complexities. We must be prepared to repair our equipment and to maintain it. We must have the necessary pumps, pulling machines, hydraulic tools and so forth necessary to support a complex salvage operation. Further, in light of the fact that we can expect to have less than one salvage ship per battle group in the future, we must ensure that that ship will be able to support whatever operations are required. This may include providing, in addition to its own support, some backup capabilities to other ships for fire fighting and damage control.

. . . in light of the fact that we can expect to have less than one salvage ship per battle group in the future, we must ensure that that ship will be able to support whatever operations are required.

In addition, the size of our ships is further driven by the high standards of habitability and manning required to sustain the standard in-port watch sections, fire parties, etc. This combination of elements sets a minimum floor on the size and manning of any ship.

I recite these constraints so that each of you, as you have an opportunity, can support what we are doing in the procurement of our new class of salvage ships. And, so that you can support our position with an understanding of the constraints and boundaries which define the size and shape of any future salvage ship we might procure. Such constraints preclude our procuring anything smaller or simpler than the present ARS-50 Class ship now being contracted.



Line Throwing Rocket — The Salvor's Missile Battery

LCDR R. J. Gray, USN
USS OPPORTUNE (ARS-41)

Aboard a salvage ship, chances are the magazine contains a powerful aid to salvage operations that has never been used or even trained with. This aid is the 2.75-inch line throwing rocket MK 49. It is interesting to note how many fellow salvors have ever used one.

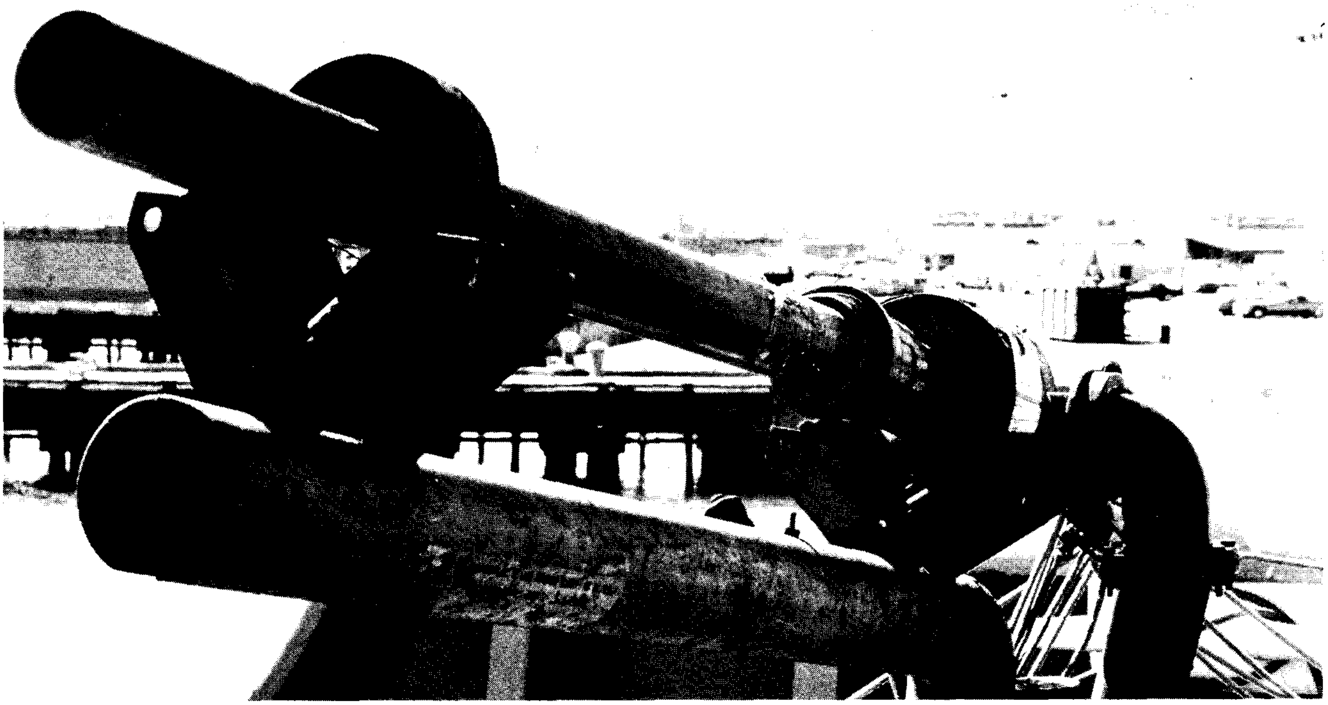
The MK 49 was designed to "throw" a 3/8-inch braided nylon line a maximum of 700 yards to a stranded or distressed vessel. This line can be used as a messenger for a towline or for other purposes. The rocket is safe, easy to use and not only effective, but rather spectacular in actual use. Not only "G-ships" get to fire missiles!

The MK 49 system consists of three basic parts: the rocket-dummy warhead assembly, the launcher tube and the container of 2,500 feet of line. The reference for the entire system is "OP 3519" (first revision), which details the setup and operation of the rocket.

The rocket consists of a 33-inch rocket motor, which has a nozzle assembly and a wire bridle at the after end. The messenger line is attached to the wire bridle before firing. A dummy warhead, which provides aerodynamic streamlining, is shipped separate from the rocket and is threaded into the rocket motor before loading. An ignition lead protrudes from one of the nozzles. The electrical plug on the end of this lead is attached to a bracket on the launch tube, and the firing switch lead is attached to the bracket to permit ignition of the rocket. The entire rocket assembly weighs approximately 20 pounds.

The rocket launch tube MK 131 is a 4-foot-long steel tube, slotted on one side, with an "elbow" at one end to serve as a blast deflector. The rocket is loaded nozzle-end first, with the wire harness protruding from the slot. The rocket is held in place before firing by a spring-loaded detent assembly. Two V-shaped clamp assemblies are attached to the launch tube, permitting the launcher to be hung below a 3-inch gun barrel or fire monitor.

Since present salvage ships don't have 3-inch guns, the fire monitors are used. On OPPORTUNE, the monitor on the bow was not long enough to allow both clamp bands to



MK 131 launcher hung on OPPORTUNE's bow fire monitor. *photos by: OS1 C. Lawson, USN*

engage the monitor barrel, so the monitor nozzle was removed and a length of pipe inserted to support the forward clamp of the launcher. Since the rocket does not exert any significant force on the launcher, the pipe extension does not have to be heavy or securely fastened. The monitor itself is trained in the desired direction and secured with line to prevent movement.

Range of the rocket depends on the elevation of the launch tube, which is easily adjusted when attached to the monitor. The graphs in the *OP* 3519 show a minimum range of approximately 610 yards at 10° elevation and a maximum of 700 yards at approximately 25°. According to the *OP*, the range is also affected by temperature.

Considering the small change in range, elevation of the launcher is not too critical. As long as the line reaches the target, one can be rather indifferent to the actual range of the rocket. Of more concern is the deflection caused by crosswind. Here, the graphs of *Appendix A* of the *OP* allow the firing ship to compensate for crosswind effects of up to 50 knots.

In addition to the *OP*, there is also a PMS card which covers the maintenance of the launcher and the loading and firing procedure for the system. The loading procedures are detailed and explicit, but they do not call for a specific check of the firing circuit prior to connection of the firing lead to the rocket ignition lead. On OPPORTUNE, a check was made, using a voltmeter, to ensure that the firing circuit worked properly and that no stray voltages were present on the firing lead prior to connection. Firing can be done with either a standard blasting machine or with a 24- 28-volt battery.

There are no unusual safety precautions required with the rocket: but, as with any munition, safe and careful handling are paramount. The rocket motor ignitor circuit is HERO susceptible when the shorting cap is removed and the firing circuit is not yet connected. Accordingly, securing all 2-32 MHz comm. gear and 200-225-MHz radars is required while connecting the firing lead. Personnel conducting the actual firing should wear eye and ear protection.

Firing the rocket is spectacular, with much noise and some smoke. Blast damage is practically nonexistant, and no burn or scorch marks are usually evident. The shot line comes out of its box at a tremendous speed and seems to rise straight up for almost 20 feet before curving over to follow the rocket. The line box must be placed so that there is no chance of the line fouling on any part of the ship. The line can be reused, but you must have a "former" (a square frame with long pins to coil the line on), which is not included with the line. A "former" should be provided with every order of four or more lines and can be reused indefinitely. The *OP* illustrates the procedure used to recoil the line.

The MK 49 rocket is an important part of any salvor's equipment and has a variety of uses, especially in heavy weather or shallow water. Since it is so seldom used or trained with, however, chances are that the equipment is less than completely ready. Launcher, firing lead, batteries/blasting machine and personnel safety equipment should all be checked for readiness and a line former obtained if necessary. Someday, it may all be needed for a salvage "missile-ex."

NO ROOM FOR MISTAKES

AO1 A.W. Pitts, III
Naval School, Explosive Ordnance Disposal

Practicing bomb removal.

Periodically, one picks up a newspaper or magazine and sees the following headlines: A-Bomb Lost off Palomares, Spain; Mine Recovery Operations Held in the Suez Canal; Civil War Cannonball Found by Atlanta Housewife. These are just a few of the incidents publicized almost daily.

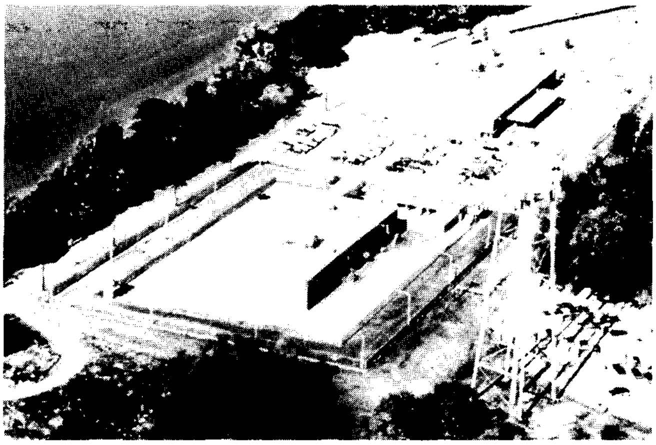
Who handles these explosive devices? Who disposes of them so that the area will be safe to work and live in again?: the United States Navy Explosive Ordnance Disposal (EOD) Personnel.

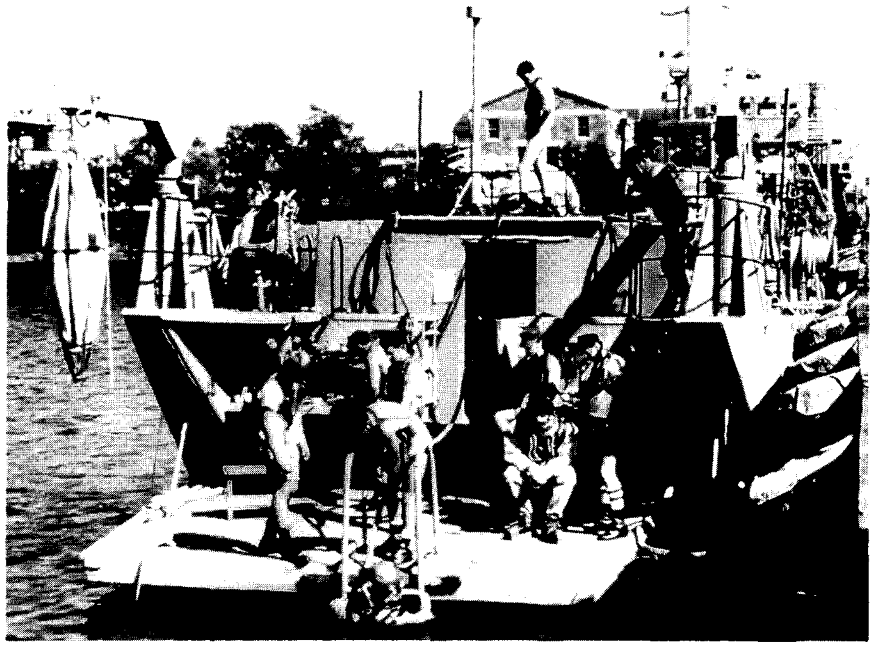
EOD dates back to World War II, when the Mine Disposal School was founded in May 1941 at the Naval Gun Factory, Washington, D.C. The Bomb Disposal School was established the following year (January 1942) on a corner of the American University campus, also in Washington, D.C.. Following World War II (1945), the Mine and Bomb Disposal Schools were combined as the U.S. Naval School, Explosive Ordnance Disposal at the Naval Powder Factory (now the U.S. Naval Ordnance Station), Indian Head, Maryland. The school is located along the Potomac River, 30 miles south of Washington, D.C.

The EOD community is a small, select group of volunteers—officer and enlisted—who are trained to recognize, render safe, and dispose of all explosive ordnance, both on the surface and under water.

Training for this elite group involves 45 weeks of an intense and rigorous regimen. The beginning student enters training at Redstone Arsenal, Huntsville, Alabama. Here he encounters the Pre-conditioning Physical Fitness Program, designed to prepare the student for the mental and physical challenges that are ahead. Phase I of Explosive Ordnance Disposal Training involves learning the unique features of chemical agents and munitions—how to identify, render safe, and dispose of all chemical ordnance, worldwide.

Upon completion of Phase I, the student proceeds to Indian Head for





Clockwise from top, left: Aerial view of Naval School, EOD; Chemical agents training; MK 5 training; SCUBA training; beach clearance; and physical fitness training.

Phases II and III, which include Basic Diving Training. This demanding course requires total commitment from each student as an individual and team member. The student is required to participate in a rigorous physical training program in preparation for the stressful environment of underwater diving. At the same time, the student will receive instruction in diving physics, medicine, cardiopulmonary resuscitation (CPR), dangerous marine life, and diving diseases and injuries.

The first encounter with Navy diving equipment is open-circuit SCUBA. The student is exposed to a variety of diving conditions: working dives in the dark, muddy water of the Potomac River, cold weather diving, 100-yard surface swims, and 130-feet-of-seawater (FSW) qualification dives. After successful completion of the SCUBA phase, the student progresses to the surface-supplied section, where he receives in-depth instruction in the use of surface-supplied diving equipment supporting the EOD mission.

The student is instructed in the operation, repair, and maintenance of the MK 1 Mask (qualifying to a depth of 170 FSW, the MK 5 hard hat and MK 12 SSDS, qualifying in both to 190 FSW. His training also covers the highly technical MK 6 mixed-gas Underwater Breathing Apparatus, a system designed to maintain a diver's non-magnetic and low acoustic signature.

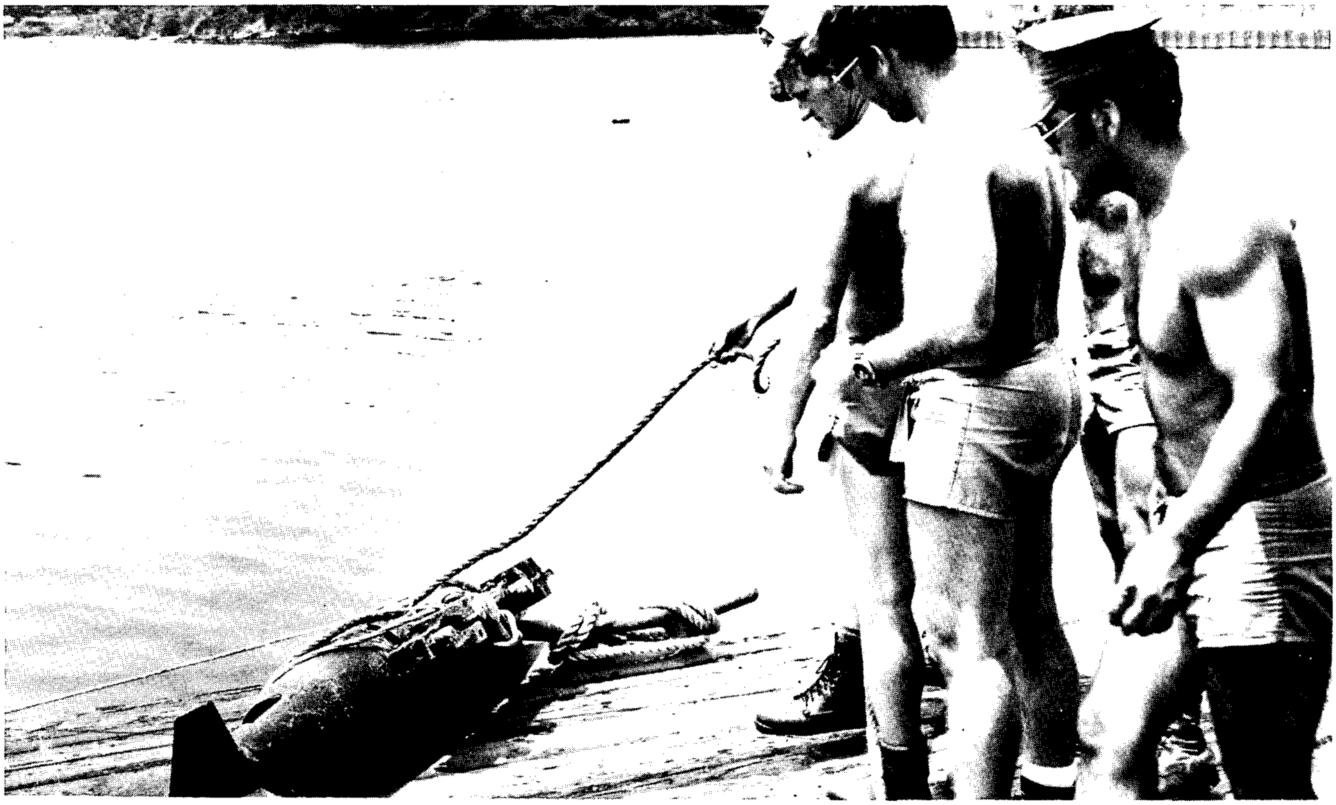
Phase II incorporates the academic knowledge involving basic and advanced demolition procedures, explosive ordnance disposal techniques on grenades, land mines, booby-traps, guided missiles, aircraft explosive hazards, rockets, projectiles, bombs, bomb fuzes, improvised explosive devices (homemade bombs), and underwater ordnance including mines, torpedoes, and depth-charges used by the United States and other Countries.

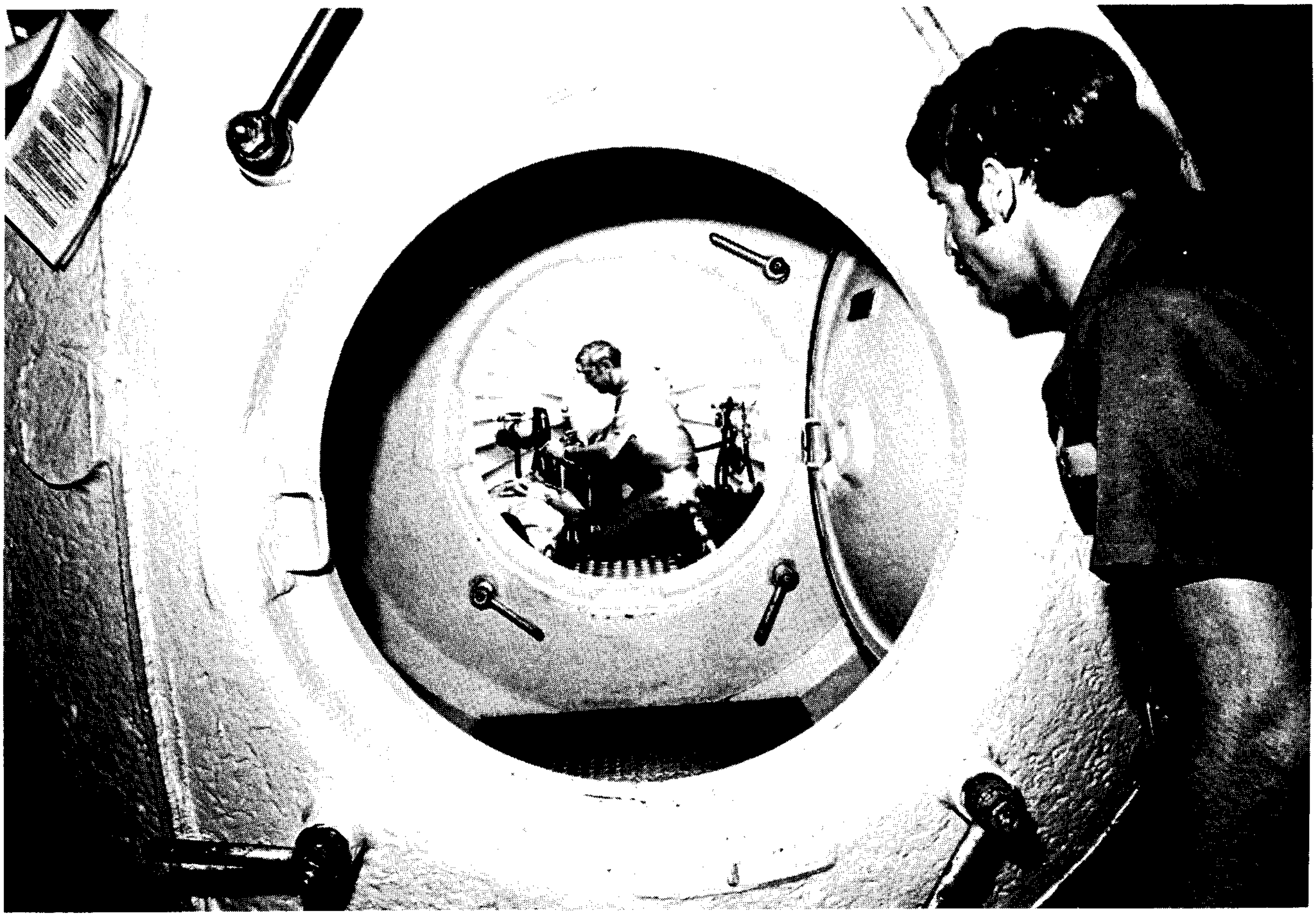
Phase III of training is devoted to Nuclear Ordnance and the hazards associated with this sensitive environment. Areas of training include nuclear physics, radiation principals, and nuclear weapons.

After successful completion of Phase III, students go to Solomons Island on the Patuxent River, where they perform the actual job tasks required of an EOD Technician in real-life situations. Diving from a highly sophisticated Diving Support Craft (EODS-LCM-8), the students demonstrate beach clearance, drill

SCUBA training.

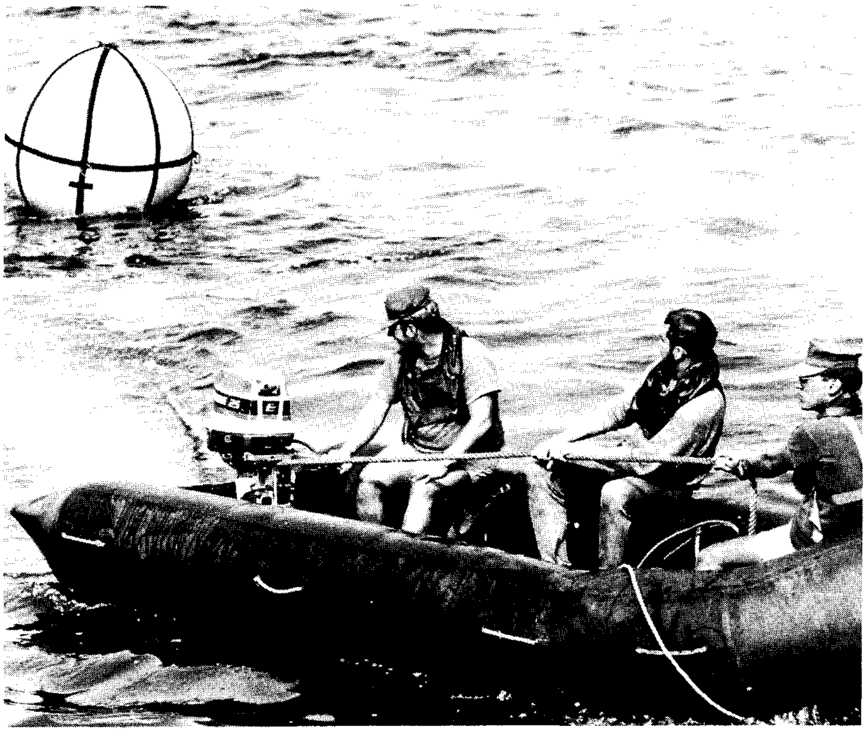
Bomb recovery during practical underwater training.





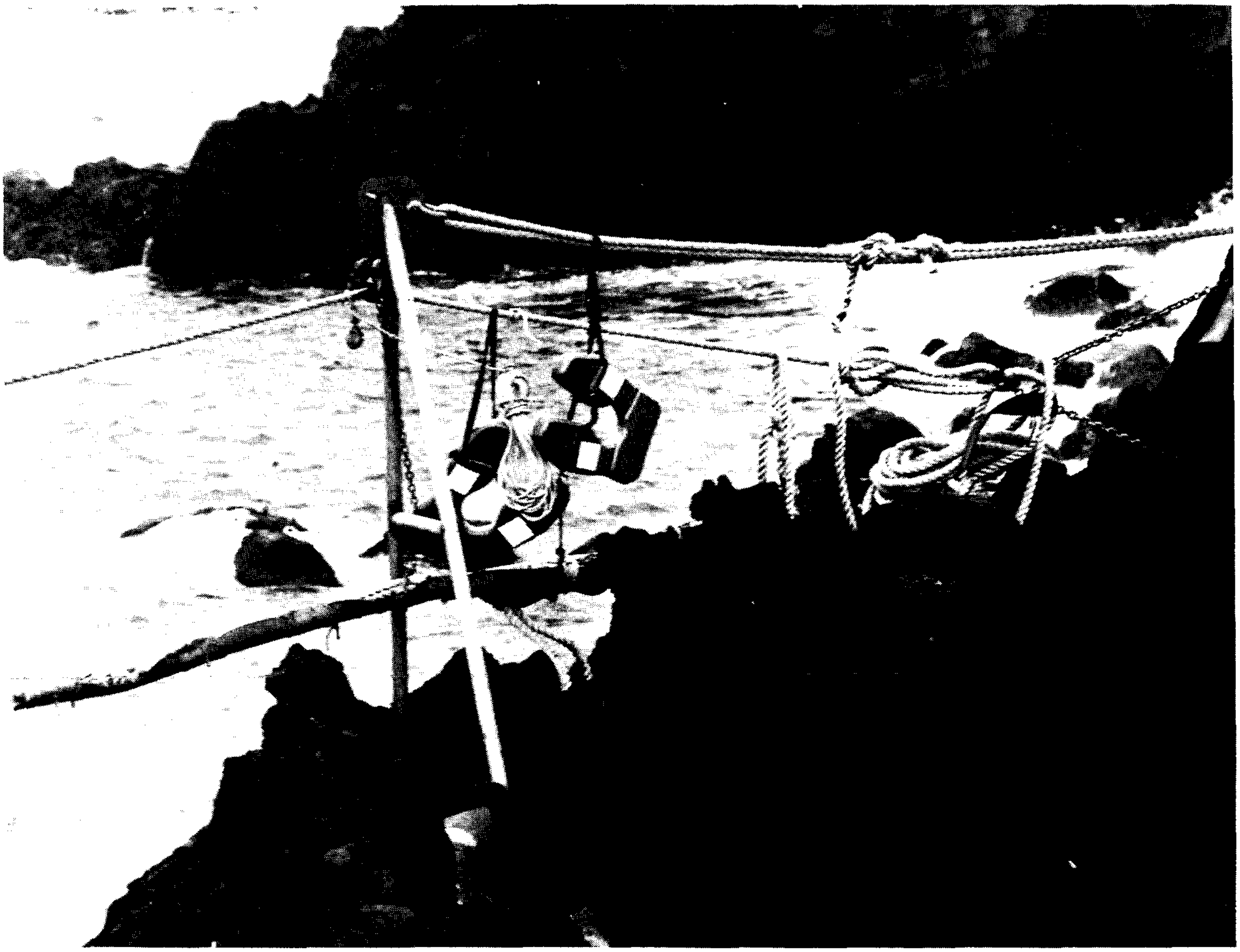
NAVSCOL EOD recompression chamber facility.

Removing mine by buoyed lift during practical training.



mine and aircraft recovery, sonar detection, location, identification, and recovery of underwater ordnance items.

After 45 weeks of intense training and an optional 3 weeks of Basic Parachute Training in Lakehurst, New Jersey, the men graduate as Explosive Ordnance Disposal Technicians. They will then be assigned to either EOD Group ONE at Barbers Point, Hawaii, or EOD Group TWO, Fort Story, Virginia, supporting the Fleet as part of an elite EOD Team. Other challenging duty assignments include approximately 40 detachments in such places as Panama City, Florida; Coronado, California; Crane, Indiana; Alaska, or Scotland. Graduates also have an opportunity to be selected to participate in the Personnel Exchange Program with Canada, the United Kingdom, or Australia.


The "Amtrak Commuter" highline to work at Ponta Delgada, Azores.

Ponta Delgada: A Nice Place to Visit . . . But No Place for Salvage

LCDR S. W. Delaplane, USN
CO, Harbor Clearance Unit TWO

On 31 October 1980, two sections of the floating drydock LOS ALAMOS (AFDB-7), which supports submarine repair in Holy Loch, Scotland, were driven aground approximately 6,000 yards from the port of Ponta Delgada on the island of San Miguel, Azores. These drydock sections, designated ECHO and GOLF, had been in tow to Charleston, South Carolina, for overhaul, but were lost in severe weather. Each of these strategically important pontoons was identical: a length of 240 feet, a beam of 101 feet, displacement of 2,800 long tons, approximate draft of 12 feet and twelve ballast tanks.

The ECHO pontoon grounded in approximately 10 feet of water against a sheer lava cliff and was resting atop a lava pinnacle, which had penetrated an outboard ballast tank at one end. Seas in excess of 6 feet, driven by winds of 30 knots or more, caused the ECHO pontoon to pound on rocks just beneath the bottom in numerous areas, eventually holing 11 of the 12 ballast tanks.

The GOLF pontoon grounded in approximately 8 feet of water atop two pinnacles, which penetrated the bottom at opposite corners of the pontoon. Unlike ECHO, which was accessible by scaling down the cliffs, GOLF was almost 50 yards from the cliff, and highlines were utilized to transfer personnel.

COMSERVRON EIGHT was tasked with the salvage of the two pontoons. A task element was

M/V SIMSON moving in to "harness" GOLF pontoon.

established and was comprised of USS RECOVERY (ARS-43), USNS POWHATAN (T-ATF-166) and detachments from USS OPPORTUNE (ARS-41) and Harbor Clearance Unit TWO. In addition, a German salvage tug, M/V SIMSON from the Bugsier Salvage and Towing firm, was contracted through the office of the Supervisor of Salvage and was on scene throughout the operation.

The initial HCU detachment flew to Terceira for transport to the island of San Miguel. Another HCU team embarked POWHATAN for the 8-day transit to the Azores. As the initial team was coming into the airport at Ponta Delgada, San Miguel, the aircraft circled above the two grounded pontoons. The salvage team onboard the aircraft had an unforgetable perspective of the job at hand. The two pontoons looked like large steel football fields alongside the cliffs. Motion was evident as seas broke over the decks and the spray was whipped by the swirling winds against the face of the cliffs. Almost audible over the drumming of the aircraft engines was the eerie, siren-like wailing of the pontoons as they scraped and grated on the craggy lava underpinnings—an unnerving sound each salvor would soon learn to tolerate. There was little doubt that mother nature had staked her claim in a high stakes game . . . but the salvors had yet to ante up!

Two separate diving and salvage teams were set up and each team was assigned specific responsibilities for their respective pontoon. Initial survey information revealed that the GOLF pontoon was for the most part evenly supported on the two grounding points and, although there was evidence of progressive flooding in the ballast tanks, excessive hull stress did not pose an immediate concern.

The ECHO team, however, found that their pontoon was "working" extensively. Progressive ballast tank failure was causing serious flooding and was setting up observable wracking stresses in the hull. It was apparent that the ECHO pontoon was in danger of either breaking up or slipping off the single grounding point and sinking. The water depth at the face of the lava cliffs averaged approximately 30 feet of seawater (FSW), but fell off precipitously to over 250 FSW.

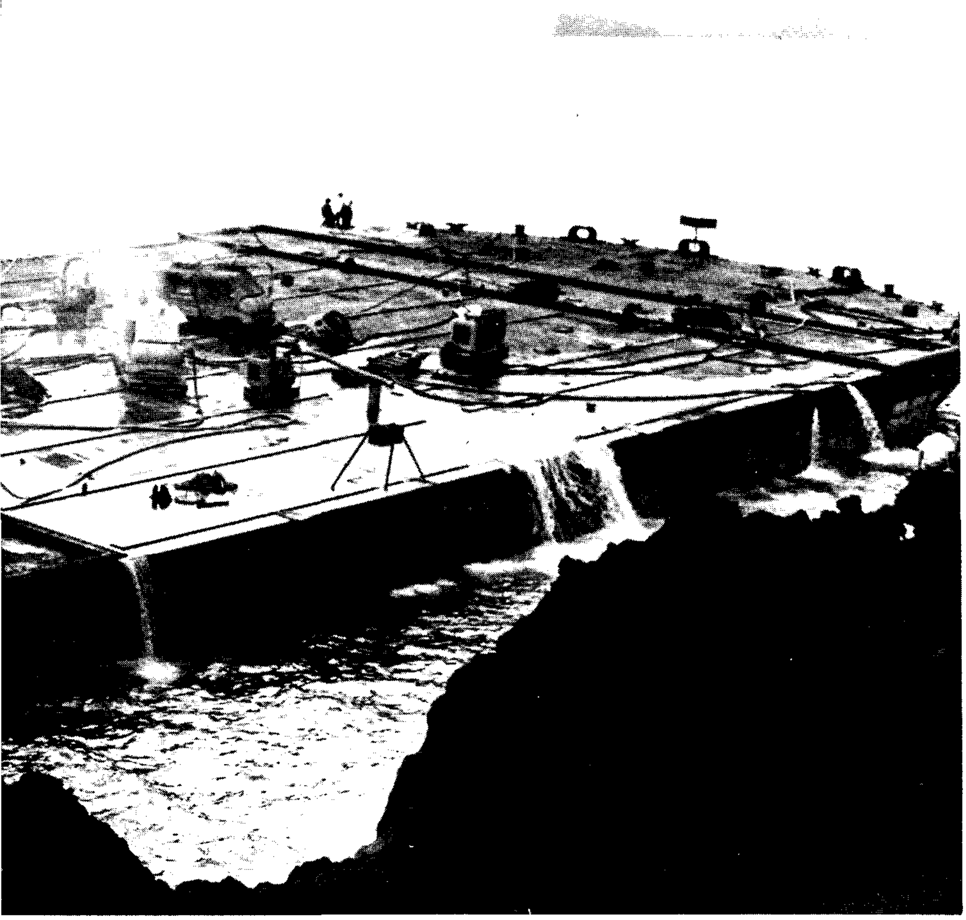
Although there was minimal holing in the side hull plating, the bottoms of each pontoon were irreparably breached. Pumping was therefore not a viable option to restore buoyancy. The salvage plan adopted for each pontoon was straightforward: Blow and go! Each ballast tank would have to be fitted with a blow pipe and valve, and airtight integrity would have to be achieved by sealing the main deck and sides. Compressed air would be used to drive water out of the holes in the bottom and regain initial buoyancy. Once the draft had been reduced as much as possible, SIMSON would be harnessed to perform the retraction.

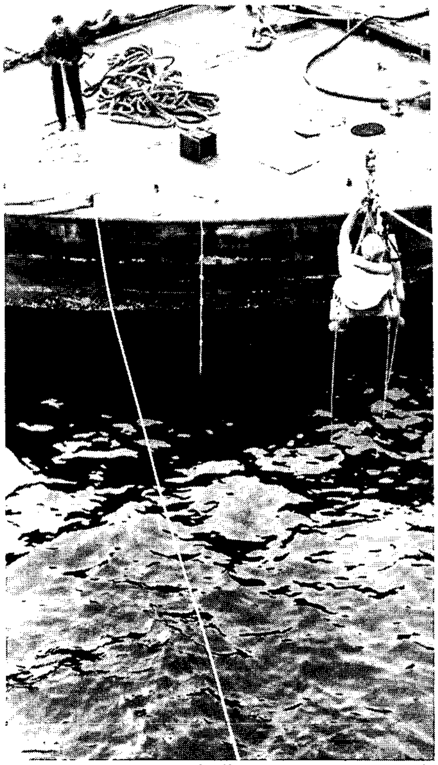
The industrial support available in Ponta Delgada was minimal. The first several days were spent in a frenzied search of all hardware stores, metal suppliers and *the* lumber company, procuring vent piping, valves, wood, gasketing and other materials. A message request for ESSM support equipment (600-CFM air compressors, hoses, manifolds, vent piping and valves) was coordinated by COMSERVRON EIGHT. In view of the limited access to the pontoons and the prevailing strong winds and heavy seas which had precluded seaward access, a CH-53 (12,500-pound cargo lift capacity) had been requested and was arranged for air transport along with the other equipment onboard a C-5A military transport. Notwithstanding an intensive effort stateside, it was anticipated that the helicopter and equipment would not arrive on scene for 8 days. This timeframe was an element that the rapidly deteriorating condition of the ECHO pontoon would not accommodate.


GOLF pontoon getting under way.

The Bugsier salvage tug SIMSON was an exceptional ship and would afford some unique capabilities that would be instrumental in the timely salvage of both pontoons. SIMSON had an inventory of truly "portable" salvage equipment, which could be handled by one or two people and included diesel pumps, an 85-cfm air compressor and a 100-amp suitcase welder. Furthermore, with 16,000 shaft horsepower (SHP), she could develop a bollard pull in excess of 140 tons. In view of the extremely poor holding ground for beach gear ground legs and the expedience with which SIMSON's 140-ton pull could be harnessed, it was decided that only SIMSON would be utilized for the retraction effort.

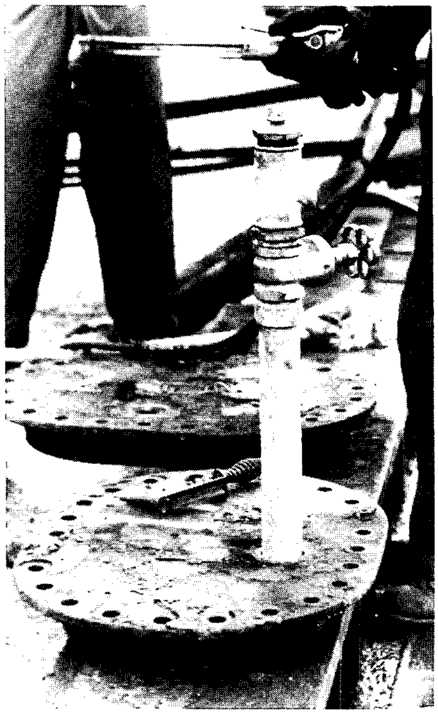
As fast as the logisticians could "scrounge" materials locally, the ECHO salvage team employed them





NAVSEA's Jim Bladh commuting to work.

Blow pipe and valve ready for welding.



in their work. The 24 ballast tank manhole covers were removed. And, since workboat access alongside was not possible because of rough seas, the manhole covers were highlined to the top of the cliffs and then "mule-hauled" almost 1 mile across the craggy lava terrain to the nearest road. They were then taken to RECOVERY, where the hull tech's set about cutting and fitting vent and blow pipes on each one. As the manhole covers were completed, they were dragged back to the salvage site and highlined to the ECHO team for re-gasketing and installation.

An "A-frame" was designed and fabricated by RECOVERY's craftsmen. After an aborted attempt to transfer it to the ECHO pontoon from the 35-foot workboat, it was finally carried over land and highlined onboard. Using SIMSON's suitcase welder, the A-frame and backstay padeyes were welded to the

HT2 Garon at work fitting blow piping to a manhole.

LT(jg) Magaraci going to work on the "slide for life."

deck and the back-stays were installed. Three low pressure (LP) air compressors had been obtained from local construction sites and were staged with RECOVERY's 125-cfm salvage air compressor.

By the evening of 6 November, all manhole covers had been replaced and sealed. ECHO pontoon was noticeably distorted by the torsional wracking stresses set up as the free floating end progressively sank. To try to relieve these stresses, all vent valves were opened as the tide ebbed. The water level in the ballast tanks then fell. At low tide the valves were closed and, as the tide flooded, partial buoyancy was captured. This maneuver significantly reduced the torsional stresses.

After 8 days of sustained winds and heavy seas, it became evident that a miracle of sorts was needed if there were going to be an opportunity to load the air compressors onboard ECHO pontoon. On the morning of 8 November, requests for "Divine assistance" were answered. The wind, although undiminished, shifted 180° and knocked the seas to a gentle roll. The 35-foot workboat then made several trips with the air compressors. A 15-hand working party onboard ECHO pontoon eagerly provided the dynamics for the A-frame's four-fold purchase as each compressor was quickly loaded onboard. The compressors were connected and each tank was blown in planned sequence and tested for air-tight integrity.

At about 1500, after it was apparent that the seals were holding, tug SIMSON was directed to proceed to the scene. The tow wire was passed and connected in to the towing bridle which had been recovered and rigged previously. SIMSON then began gradually "adding turns." SIMSON's stern began to squat as she came to full power and the pontoon pivoted to seaward on its grounding point until it aligned with SIMSON. The tow wire, looking like a straight steel bar, did not flex as SIMSON pulled against the lava pinnacle top which penetrated the pontoon's bottom. After nearly 15 minutes at full power, the bottom plating gave way and, amidst the grating of steel and cheers of the salvage team, ECHO pontoon broke free and followed SIMSON's mighty hand to port. However, the jubilant mood was short-lived.

The GOLF pontoon, although progressively flooding, was riding well. The CH-53 helicopter and crew arrived on 9 November along with the ESSM equipment, which had been air-lifted from Lajes Field, Terceira to Ponta Delgada in four loads by a C-130. Part of the ECHO team set up a security watch on the ECHO pontoon and the remainder assisted in staging equipment at the airport in preparation for the helo transfer to GOLF pontoon.

Taking the early morning "Bosun's chair express" and the "slide for life" to work, the GOLF team arrived onboard GOLF pontoon and made preparations to receive the equipment from "Salvor's Angel One". Several air compressors, welders and associated equipment were transferred before strong winds and seas rendered air operations unsafe. Mother nature's ill-temper heralded the dawning of 10 November, and GOLF team went into a holding pattern as seas washed the deck of GOLF pontoon.

MM2 Sewell going to work on the "bos'n chair express."

The weather moderated overnight, and GOLF team members resumed their work. Remaining equipment and materials were loaded onboard the pontoon from the airport. With the welders and equipment onboard the process of installing vent and blow piping progressed rapidly, as did the gasketing and sealing of manhole covers. An internal inspection revealed that eight of 12 ballast tanks had failed.

On the morning of 12 November, the three remaining manhole covers were sealed. The air compressors and 6-inch salvage pumps for the engineering spaces were started and dewatering commenced. In contrast to dewatering the ECHO pontoon, GOLF pontoon, by virtue of the large volume air compressors and manifolding, was dewatered in roughly 90 minutes . . . approximately one-fourth the time required for ECHO pontoon.

As GOLF pontoon became "lively", SIMSON was directed to proceed to the site to get in harness. Again in contrast to the previous salvage effort, GOLF pontoon, displaying almost an eagerness to relinquish her claim to land, moved seaward under the gentle persuasion of SIMSON's bull rope. GOLF pontoon was moored at the quaywall at 1630, thus concluding salvage operations.

The salvage teams now focused on demobilizing equipment and preparing the pontoons for return to Norfolk, Virginia. Because of the extensive bottom damage, it was decided to load each pontoon on submersible barges. These barges were obtained from commercial oilfield contractors through the Supervisor of Salvage.

RECOVERY and part of the HCU detachment departed 27 November. POWHATAN and the remaining HCU team remained in Ponta Delgada, awaiting the arrival of the submersible barges. The commercial tug BULWARK, with the Sublift Atlantic and Federal 400-4 in tow, arrived 30 December. ECHO pontoon was loaded onto Sublift ATLANTIC and departed in tow by USNS POWHATAN on 7 January. GOLF pontoon was then loaded and departed on 11 January in tow by M/V BULWARK.

This operation typified the natural adversity, physical challenge and logistic complexity which are inherent elements of the salvage arena. Procuring the necessary piping, valves and other materials from local sources demanded the essence of innovation; the ability to communicate in a foreign language with compelling hand waiving, pictures and pigeon english; and an instinctive awareness of potential "open purchase" material resources, which comes from childhoods mispent scavenging junkyards for parts to rebuild old Edsels. The two salvage efforts were an interesting contrast of old and new. The ECHO pontoon was refloated in 8 days by classical means: A-frames, highlines, four-fold purchases and the like. The GOLF pontoon was salvaged in 2 days through the expedience of modern aircraft technology. This author draws no conclusions, but merely points to the fact that there is a wide inventory of assets available for employment in salvage. Methodology notwithstanding, this operation was successful due to the persistence, ingenuity and team work of the participating personnel . . . from the messcooks to the commanding officers. These human qualities have been the instruments of success throughout the history of Naval salvage and are the mainstay of the professionalism and readiness of Naval Salvage Forces today.

Task Element Organization/Participating Personnel:

On-Scene Commander/Salvage Master: LCDR S. W. Delaplane, CO, HCU 2

USS RECOVERY (ARS-43): LCDR H. A. Stephans, Commanding Officer

USNS POWHATAN (T-ATF-166): CAPT H. Pouttu, Master

HCU Detachment:

LT L. M. Sawyer, USN
Salvage Engineer
LT(jg) Magaraci, USN, OIC
HTCM Apodaca, USN
BMC Jongquist, USN
HT1 Salter, USN
EN2 Dawson, USN
MM3 Sewell, USN
MRFN Wolgast, USN
EM3 Kozloski, USN
FN Lacross, USN
EM3 Pattenaude, USN
EM3 Tschida, USN
BM2 Smith, USN
GMG3 Kirk, USN

USS OPPORTUNE (ARS-41) Detachment:

ENS Mclesse, USN
HT2 Garon, USN
HM3 Bacon, USN

Mr. J. Bladh - NAVSEA (OOC)
LCDR G. J. Tettelbach, USN
Pearl Harbor Naval Shipyard

HCU-2/EOD Mobile Group TWO Recover Marine Helo

LT(jg) Frank Magaraci
Harbor Clearance Unit TWO

Harbor Clearance Unit (HCU) TWO was directed by Commander Service Squadron EIGHT on 20 September 1981 to search, locate and salvage a Marine AH-1T Cobra helicopter that had crashed in the Nuese River, 20 miles northwest of MCAS Cherry Point, North Carolina. The accident occurred while the helo was enroute to a live firing training exercise.

Initial data identified a 5-square-mile tract as the possible area of impact. The size of the area to be searched dictated the use of a side-scan sonar system for timely location of the wreckage. Consequently, Explosive Ordnance Disposal (EOD) Mobile Unit TWO (Ft. Story, Virginia) was tasked to assist in the joint search/salvage operation.

On 21 September, a CH-53 Marine helicopter transported the diving/salvage and side-scan sonar team to the worksite. After installation of a precise navigation system at a remote location, side-scan operations commenced.

Various factors had to be considered in evaluating possible contacts recorded by the side-scan sonar. Conditions affecting target detection and identification included bottom topography and density, water depth, sea state and miscellaneous bottom debris—all of which were influential during the search phase. Numerous confirmation dives were required to discount superflous recorded data. In fact, it was determined that approximately 10 days would be required to systematically cover the entire 5-square-mile search area.

Meanwhile, YDT-53 (based at HCU-2) was brought to the area to stand by as the lift platform. YDT-53 has a 10-ton rotating crane.

After 6 days of systematic search, a strong contact was picked up, marked with a buoy and, on the second dive, was determined to be the aircraft. The major portion of the helo was severely twisted and on its starboard side in 22 feet of water. The tail rotor pylon, forward cockpit area and 20-MM guns had been torn off and were lying close-by with numerous rounds of 20-MM ordnance strewn about the area.

The salvage plan called for divers to attach a ¾-inch wire strap around

Crew receiving instructions from LT(jg) Magaraci (center). In foreground are SN Burrell (left) and HM2 Heimelberger.

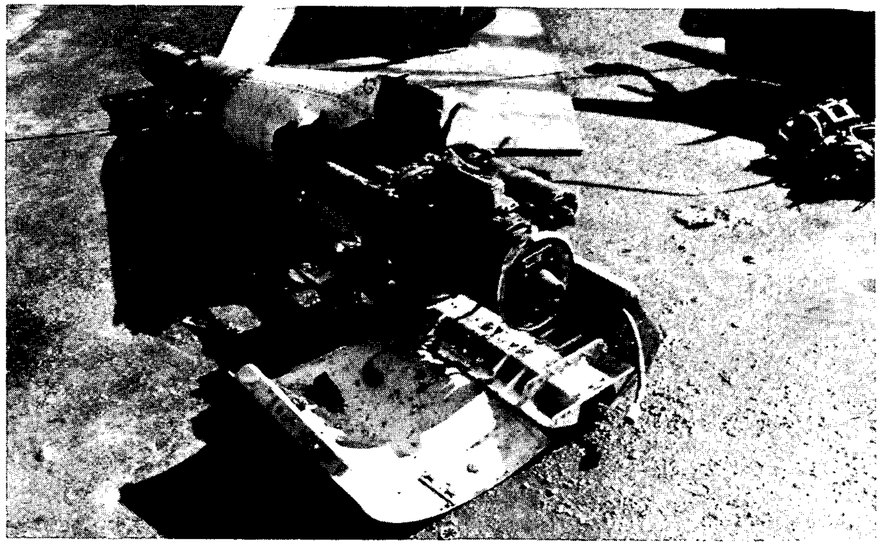
MMC (DV) G.L. Cabvly at completion of dive on wreckage

the rotor head and buoy it off at the surface. The buoy would be used as a marker for the 2-point moor of YSD-53. In addition, a 4-inch-wide, 40-foot nylon strap was "choked" around the tail section to keep the aircraft level and to provide added support while it was being hoisted to the surface.) Divers entered the water and connected the two eyes of the straps to the crane hook, which had been positioned over the aircraft. It was not desired to lower the hook into the water, so long straps were used. This procedure necessitated hanging the aircraft partially submerged from the deck edge of YSD-53 after the initial lift and then shortening the straps once the boom had reached maximum height.

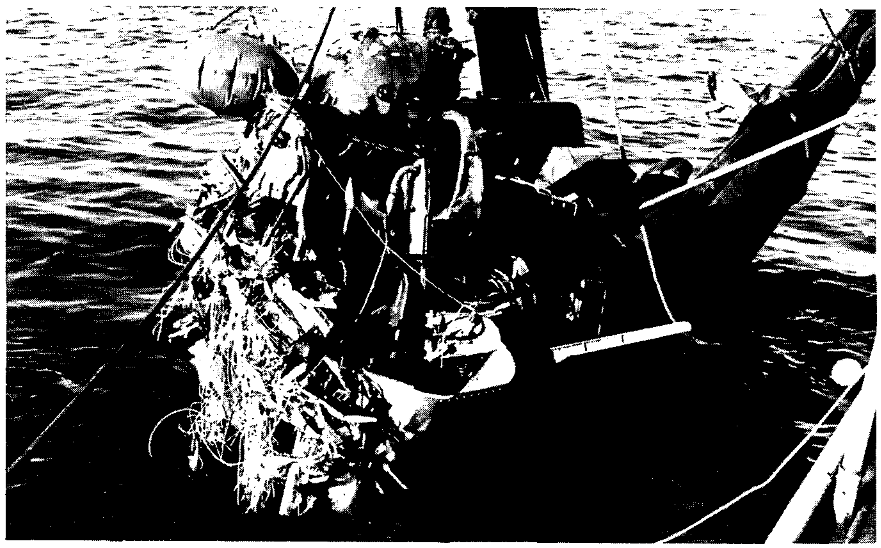
On the second "bight" the aircraft was lifted clear of the water in slow increments to allow for drainage then swung onto the deck. This first phase brought up approximately 75 percent of the wreckage.

Again, EOD divers were used, this time to recover an estimated 1,200 rounds of 20-MM ordnance and "render safe" the 20-MM cannons before placing them aboard the lift platform. The remaining scattered pieces of wreckage were recovered in a 4' x 4' x 4' expanded metal salvage basket, around which divers circled on a 100-foot circle line. The tail rotor pylon and 20-MM guns were too heavy to be handled by divers and were lifted individually with nylon straps. After recovering 97 percent of the wreckage, all items were immediately washed with fresh water and a corrosion preventative coating was generously applied to inhibit further deterioration. The wreckage was then turned over to a Marine Corps representative, concluding the recovery operation.

The most significant aspect of this job was that it proved once again that trained salvors, to be totally effective, must routinely rely on an integration of skilled technicians and sophisticated equipment to meet the objectives of today's salvage mission.

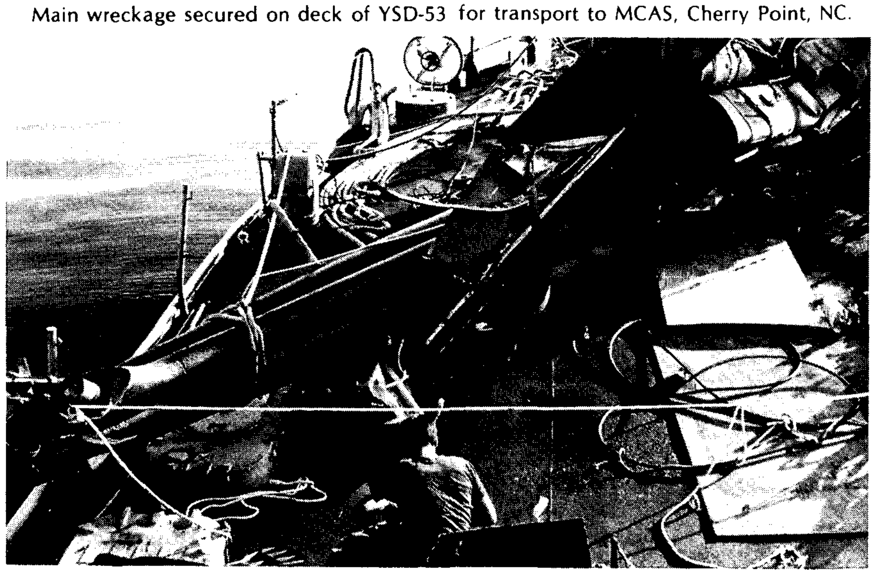


Twenty mm cannon from aircraft pod broken open.



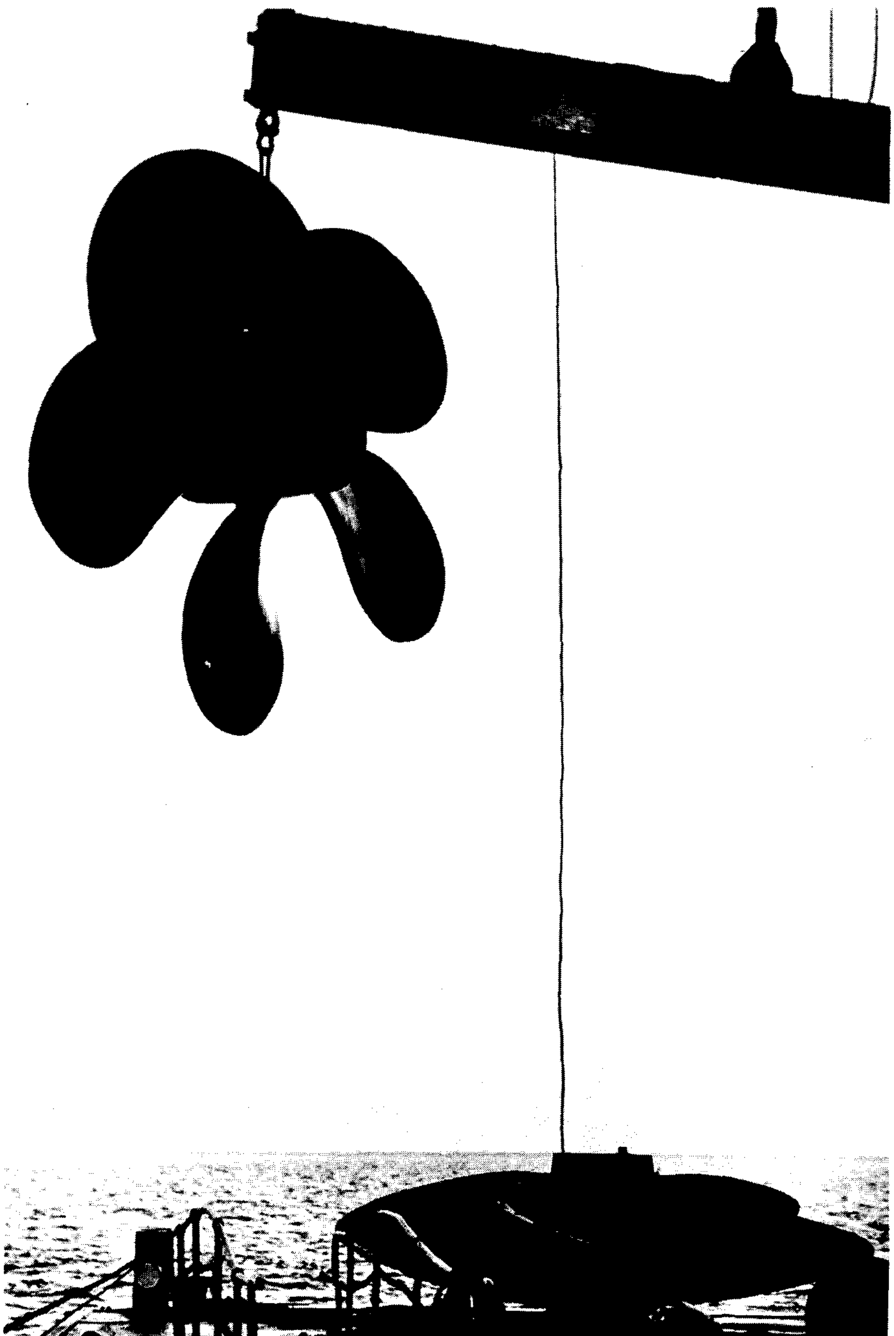
Wreckage being hoisted aboard the YSD-53.

Main wreckage secured on deck of YSD-53 for transport to MCAS, Cherry Point, NC.



HCU-1 DET. Routine Includes Waterborne Screw Change

A $118,000 refurbished propeller rests on ENGLAND's deck, ready to replace the cracked screw lifted from the water.



Cheryl May Campbell
Navy Public Affairs Office, San Diego

One could compare it to changing a tire on one's car, if it's 510 feet long, weighs almost 6,000 tons and uses 12-ton tires.

But changing a cracked screw on San Diego-based guided missile cruiser USS ENGLAND was much more complicated than changing a flat tire. It took weeks of preliminary paperwork, inspections and, finally, the expertise of a diving team from Harbor Clearance Unit ONE Detachment (HCU-1 DET), based in San Diego.

HCU-1 DET is responsible for all underwater work on surface ships homeported in San Diego, Long Beach, Port Hueneme and San Francisco. Its mobile salvage teams handle any special assignments.

The Detachment saved the Navy approximately $500,000 by changing the damaged screw, one of two on the cruiser. The alternative would have been putting the ship in a dry dock, an expensive and time-consuming option.

Although the HCU-1 DET changes approximately six screws a year, this type of work is far from routine. Each job is unique and highly technical.

Headed by veteran Diving Supervisor Wesley Seals, a Senior Chief Machinist's Mate, the six-man dive team assigned to the job began preliminary hull inspections of ENGLAND 6 weeks before the change. They arranged for the crane through the Public Works Center here and waited for the $118,000 replacement screw to arrive.

"You just don't go down and throw on a screw," says Gunner's Mate First Class Gregg Richardson, the leading petty officer of the team, "it's a lot more complicated than it sounds."

In addition to the inherent complexities of the job, the dive team had only worked together for 2 months. This team is the first to serve on the Navy's newest destroyer tender USS ACADIA, recently commissioned.

Working in 25 feet of murky water, the divers split into two-man teams with one stand-by diver. They averaged 5 hours in the water per dive.

They first removed the dunce cap. Next, a massive wrench, like a 300-pound tire iron, was lowered into the water by the floating crane. With this wrench, they loosened and removed the 600-pound boss nut.

Wrapping prima-cord around the shaft, they used a controlled explosion just large enough to jolt the screw loose. It was then shimmied off the shaft onto a counterbalanced I-beam suspended from the crane.

To put on the new screw, the procedure is reversed (without explosives).

"Underwater rigging has its problems," Seals said. "The trick is streamlining the operation, but you always have to be prepared for the unexpected."

They had their share of problems when the huge wrench cracked while removing the boss nut. Time was lost waiting for a new wrench to be brought in.

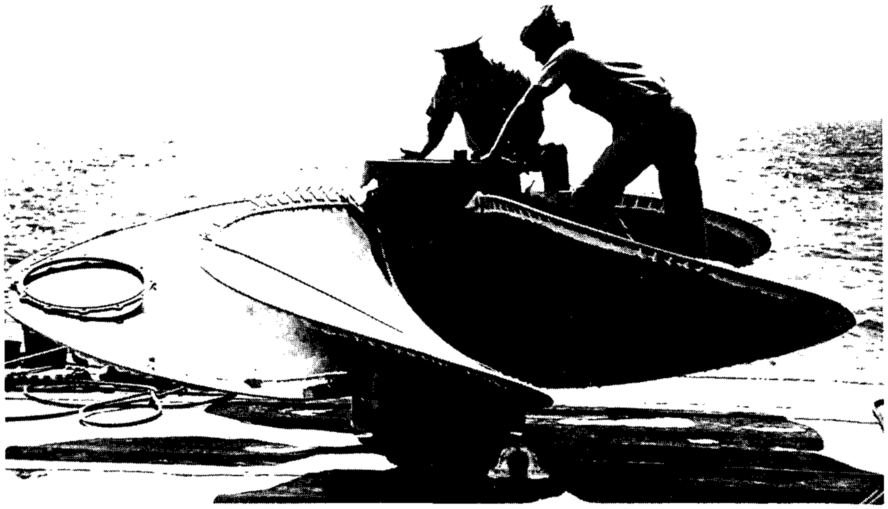
Later, the first blast failed to budge the reluctant screw. Rewrapping the shaft for a second explosion, however, did the trick.

Usually a 5- to 6-day job, ACADIA's well-trained dive team completed the job in 36 hours (spread over 4 days).

"We worked at least 14 hours a day," says Seals. "It took 336 man-hours, 75 of them in the water."

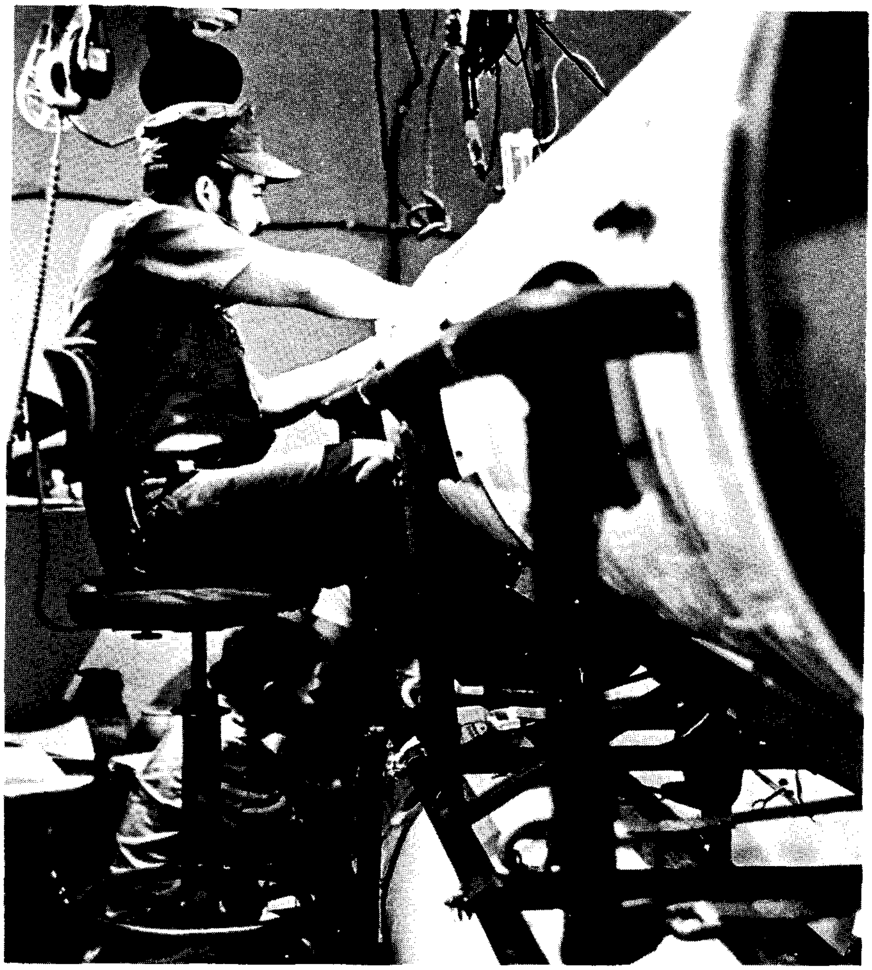
The following Monday, ENGLAND steamed out of San Diego for operations off the Southern California coast.

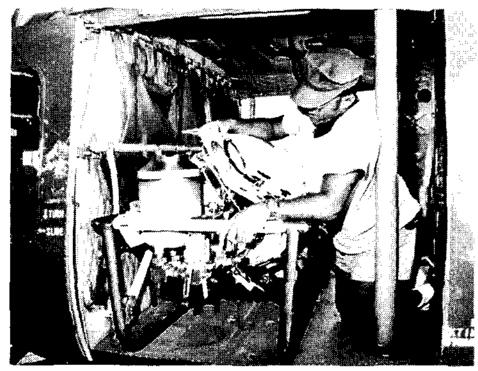
"We're living in a time when seapower is of the utmost importance," notes Richardson. "Sure, we got the job done; but, if you look at the 'big picture,' we got a disabled combatant back on the line—fast. That's our business."



CWO Tass (right) and BTC Henson check the new 12-ton replacement screw.

Diving supervisor Seals (background, right) and MM1 Bellanger give instructions on screw change.





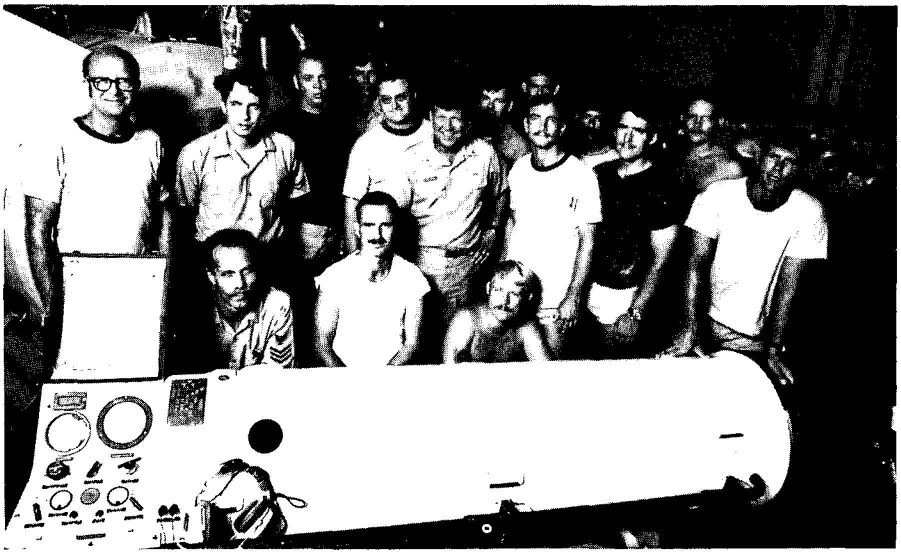
Portable Recompression Chamber Update

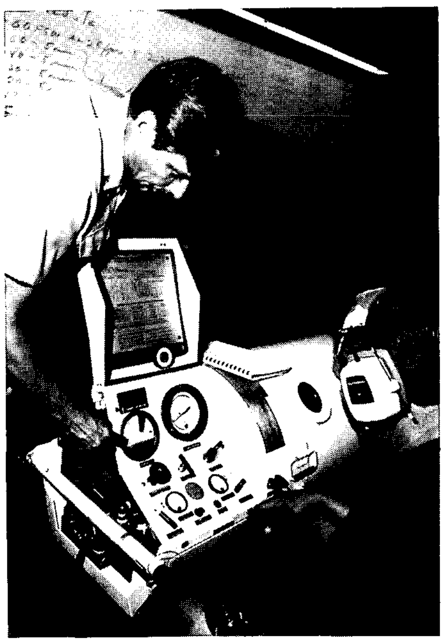
BMC(DV) James H. Bloechel
Navy Experimental Diving Unit

The Portable Recompression Chamber (PRC) is a one-man hyperbaric system for providing immediate on-scene recompression treatment to a diver suffering from decompression sickness or gas embolism. It is intended to be deployed to remote dive sites so recompression treatment can be administered, within 5 minutes of surfacing, to a diver showing symptoms of these pressure-related injuries. The PRC is designed and intended to serve as a means of transporting a stricken diver, while undergoing recompression treatment, to a larger hyperbaric facility for more definitive treatment and care.

The PRC is NOT intended as a substitute for the standard two-lock recompression chambers (RCC). It serves as an emergency chamber at sites where two-lock RCCs are not immediately available or transportable, in support of open-circuit or Mixed-gas SCUBA diving.

The PRC is 106 inches long with an inside diameter of 21-11/16 inches, proportionally designed to fit conveniently through an SSN 637 class submarine torpedo loading hatch. It is constructed of aluminum and weighs 350 pounds. It is equipped with a communication system and is capable of being operated in an open-circuit or semi-closed circuit (recirculation) mode. The PRC is an air-only system utilizing standard SCUBA tanks (72s or 90s) as the high pressure compressed air source. A mating adapter system is included with each PRC and makes possible the transfer-under-pressure of an in-





Photos above and opposite show various scenes of PRC operational training.

jured diver, while undergoing treatment, to a standard Navy two-lock aluminum RCC. The PRC Treatment Table (a modified Table 1-A) provides for timely vents and a method of surfacing and transferring to a larger RCC if the mating adapter cannot be utilized.

The key to PRC management and safe usage is through proper operational planning.

In accordance with Supervisor of Diving directives, a formal 1-week PRC Factory Training Course was conducted at the Naval Diving and Salvage Training Center (NDSTC), Panama City, Florida, during the week of 22 June 1981. During this course, instructed by BMC(DV) Jim BLOECHEL of the Navy Experimental Diving Unit (NEDU), 15 senior instructors from seven Navy Diving/Training Commands were Qualified to Conduct and Instruct PRC Operations. The 40-hours of instruction included PRC history, description, operations, emergency procedures and maintenance. In addition, all attendees "made numerous simulated dives and transfers-under-pressure via the PRC Mating System to NEDU's two-lock aluminum RCC." The Navy Training Plan promulgated by CNO serial 112D14/370977 dated 30 October 1981 establishes procedures for qualifying diving personnel in the operation and maintenance of the PRC. Instructors trained during the 22 July class will initiate local training programs at the selected service schools.

The PRC design prototype was built for the U.S. Navy at Battelle Memorial Institute, Columbus, Ohio Laboratories in 1974; the preproduction PRCs were manufactured by the Dixie Manufacturing Company in 1975. The PRC received extensive testing at NEDU in 1974 and 1976 (NEDU Report 1-74 and 3-76 refer), at the Wyle Laboratories in 1977, the Naval Submarine Medical Research Laboratory in 1978 (NSMR Report 876 refers) and again at NEDU in 1978 (NEDU Test Number 78-26 refers). Data obtained during this testing phase suggested changes to the PRC and the addition of a venting schedule to the PRC Treatment Table. Modifications to the PRC and Operator's Manual were accomplished by NEDU and the Naval Surface Weapons Center (NSWC, Code 052), Dahlgren. The first retrofitted PRC System was delivered to NEDU for transfer to NDSTC for the PRC Factory Training Course previously mentioned. After NAVSEA certification and approval for service use, NSWC will issue the retrofitted PRCs to the Naval Amphibious School, Navy spec-war Training Department (NSWTD); the Naval School Explosive Ordnanace Disposal; Harbor Clearance Unit TWO, Second Class Diving School; the Naval Submarine Training Center Pacific, Diver Training Department; and the Naval Submarine School. ASU is anticipated in FY 82.

Upon receipt of the PRCs and an accompanying training syllabus developed by NDSTC, the above Diving Training Commands will implement PRC training in accordance with the Navy Training Plan. The rationale for the PRC training concept is based upon the traditional diving practice that only trained and qualified personnel will operate or supervise PRC operations.

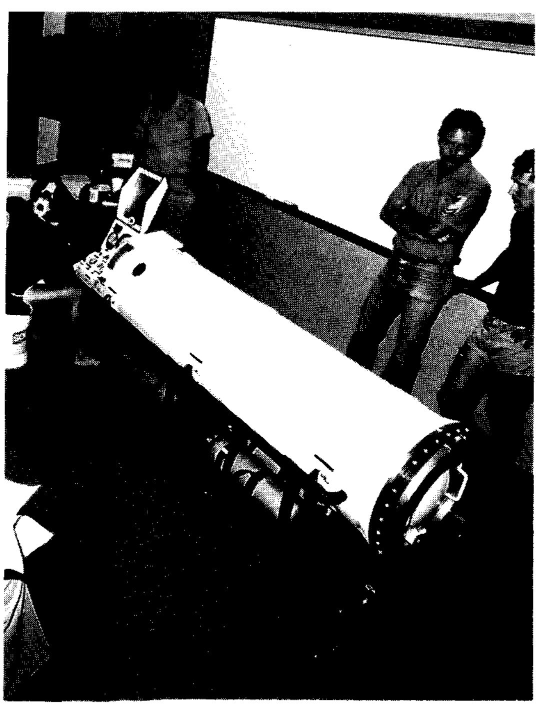
As applied to the training syllabus, there will be several levels of training and certification. First, all divers will be familiarized with PRC operations. Second, divers attached to commands with the PRC will be trained to "Assist in Portable Recompression Chamber Operations." Third, selected senior divers attached to commands with PRC capabilities will receive formal training certifying them to be "Qualified to Conduct Portable Recompression Chamber Operations"; and, lastly, PRC instructors will be qualified at NDSTC, NSWTD or NAVSUBTRACENPAC.

The following Commands are scheduled for receipt.

Naval Special Warfare Group ONE, San Diego — 4 Systems
Naval Special Warfare Group TWO, Little Creek — 4 Systems
Underwater Construction Team ONE, Little Creek, — 3 Systems
Underwater Construction Team TWO, Port Hueneme — 3 Systems
Explosive Ordnance Disposal Group ONE, Pearl Harbor — 5 Systems
Explosive Ordnance Disposal Group TWO, Fort Story — 5 Systems
Commander Submarine Development Group ONE, San Diego — 1 System
Navy Experimental Diving Unit, Panama City — 1 System

It is anticipated that within calendar year 1982, the PRC System will become a viable asset to the above Commands, extending their sphere of operations and providing their divers with an on-site emergency recompression chamber capability.

Classroom instruction and practical training with the PRC.



Navy/ Air Force Salvage F-106

On 9 July 1981, a USAF F-106 DELTA DART from Tyndall Air Force Base, Florida, developed a malfunction, forcing its pilot to eject, and plunged into the Gulf of Mexico, 6 miles south of Crooked Island Cut, Florida. The pilot was rescued. The next day, the Air Force Accident Investigation Board requested the U.S. Navy to coordinate a joint USN/USAF effort to locate and salvage the F-106 wreckage. A search was initiated, and CDR R. A. Bornholdt, USN, Commanding Officer of the Navy Experimental Diving Unit (NEDU), was designated Officer-in-charge of the salvage/recovery effort. CPO (MDV) C. A. Kidman, RN, was appointed On-scene Salvage Master.

Representatives from NEDU, the Naval Coastal Systems Center (NCSC), and Tyndall AFB took part in the search, using side-scan sonar. After 24 hours, Air Force Watercraft Branch personnel located the crash site and marked the largest item of debris. The depth of the fallen F-106 was reported as 80 feet-of-seawater.

A nine-man dive team departed for the crash site 13 July 1981, on an Air Force Missle Recovery Craft. Upon arrival, they quickly set up a SCUBA diving station. Besides CPO Kidman, the team consisted of the following personnel: LCDR D.J. Smith (NCSC), CE1(DV) M. Anderson (NEDU), EN2(DV) R. Cantrell (NEDU), HMCS(DV) C. Blair (NEDU), MM2(DV) C. Wentzel (NCSC), TSGT(DV) J. Craft (Tyndall AFB), SGT(DV) C. Norris (Tyndall AFB), and SGT(DV) J. Mollohan (Tyndall AFB).

The first dive set descended on top of what was identified as the 7,500-pound engine. After an initial survey of the wreckage area, it was reported that upon impact the F-106 had disintegrated into hundreds of small pieces. Only the engine remained in recognizable form. Subsequent dives yielded the recovery of the ACM1, 20-mm Gatling Gun and other fragments.

Dive Team: CPO(MDV) Kidman, MMCM(MDV) Yarley, HT1(DV) Matteoni, HMCS(DV) Blair, EN2(DV) Cantrell, CE1(DV) Anderson, TSGT Craft, SGT Norris, and SGT Mollohan.

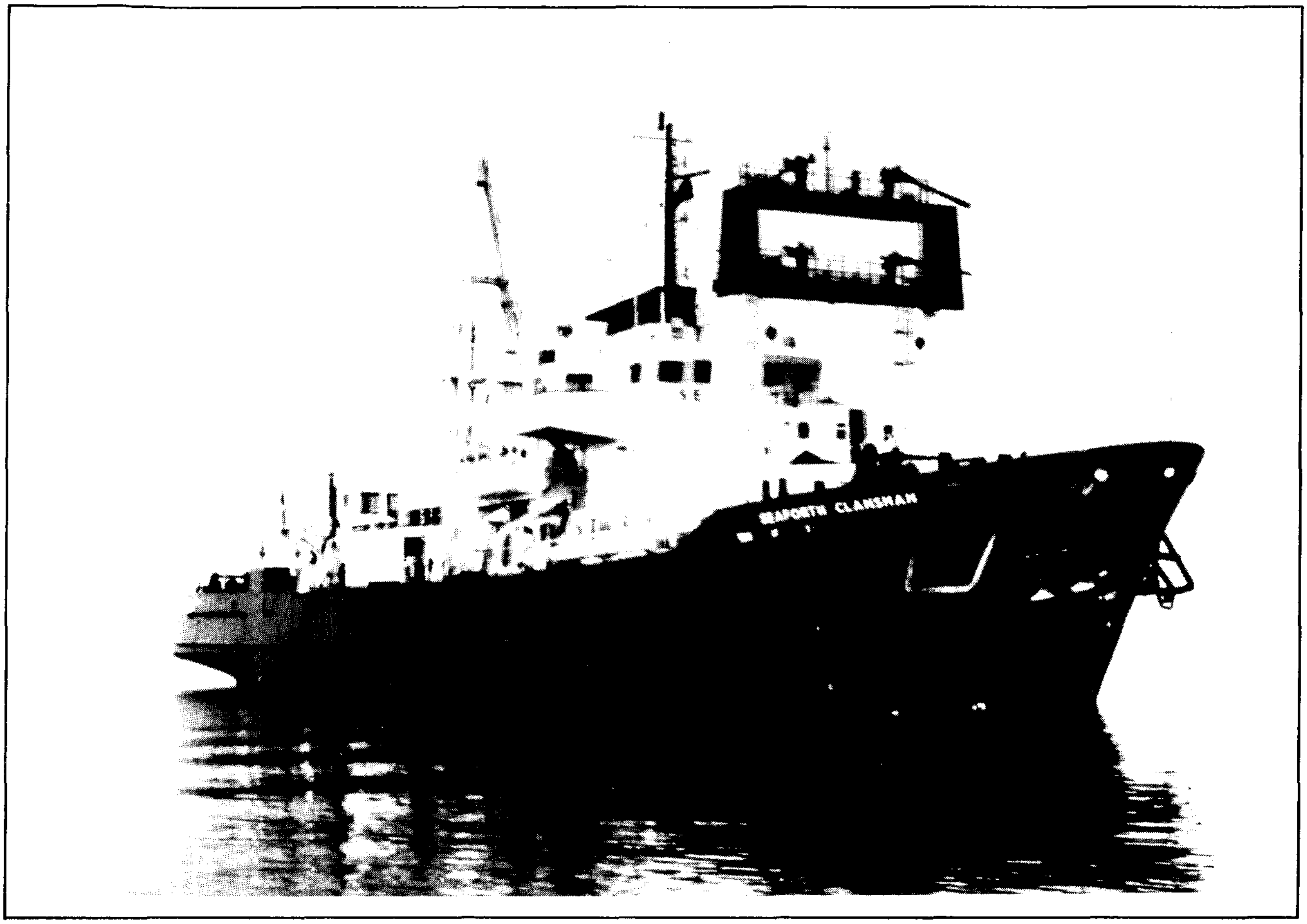
Recovery area on the USAF Missile Recovery Craft.

On 14 July, the engine, which had been embedded in 6 feet of hard sand at approximately a 60° angle, was lifted onto the deck of the YDT-15.

Following the recovery of smaller hydraulic units, it was determined that the remainder of the wreckage was in the form of scattered small pieces. The team decided to use the Air Force Missile Recovery Craft for the rest of the salvage operation, which focused initially on gathering specific motors and pumps as designated by the on-board accident investigation personnel.

The Tyndall AFB Accident Investigation Team reviewed the findings on 17 July and, on 24 July, notified CPO Kidman that the starboard landing gear actuators and associated equipment were required for a detailed investigation. Several of these items were recovered during diving operations on 28 July.

The Investigation Board then announced that sufficient wreckage had been recovered, and Diving operations were secured at 1430 hours, after a total of 88 dives and 59 hours of total bottom time.



NEDU Divers Participate in Royal Navy SAT Dives

BMC(DV) Steven M. Larson
Navy Experimental Diving Unit

On 31 August 1981, four U.S. Navy divers from the Navy Experimental Diving Unit arrived in Portsmouth, England, reporting onboard M/V SEAFORTH CLANSMAN to participate in two open-ocean saturation dives under special invitation and in company with Royal Naval Party 1007, the embarked resident diving team.

M/V SEAFORTH CLANSMAN is owned and operated by Seaforth Taywood, Ltd. She is on long-term charter to the Royal Navy, serving as their current saturation/bounce and sea-going diving platform. CLANSMAN's design is similar to that of a modern stern trawler. She is 259 feet long overall, 50 feet at the beam and displaces 3,300 tons. She sports two controllable-pitch propellers turning in Kort nozzles forward of twin rudders and bow and stern thwartship thrusters, giving her exceptional maneuverability and position-keeping characteristics.

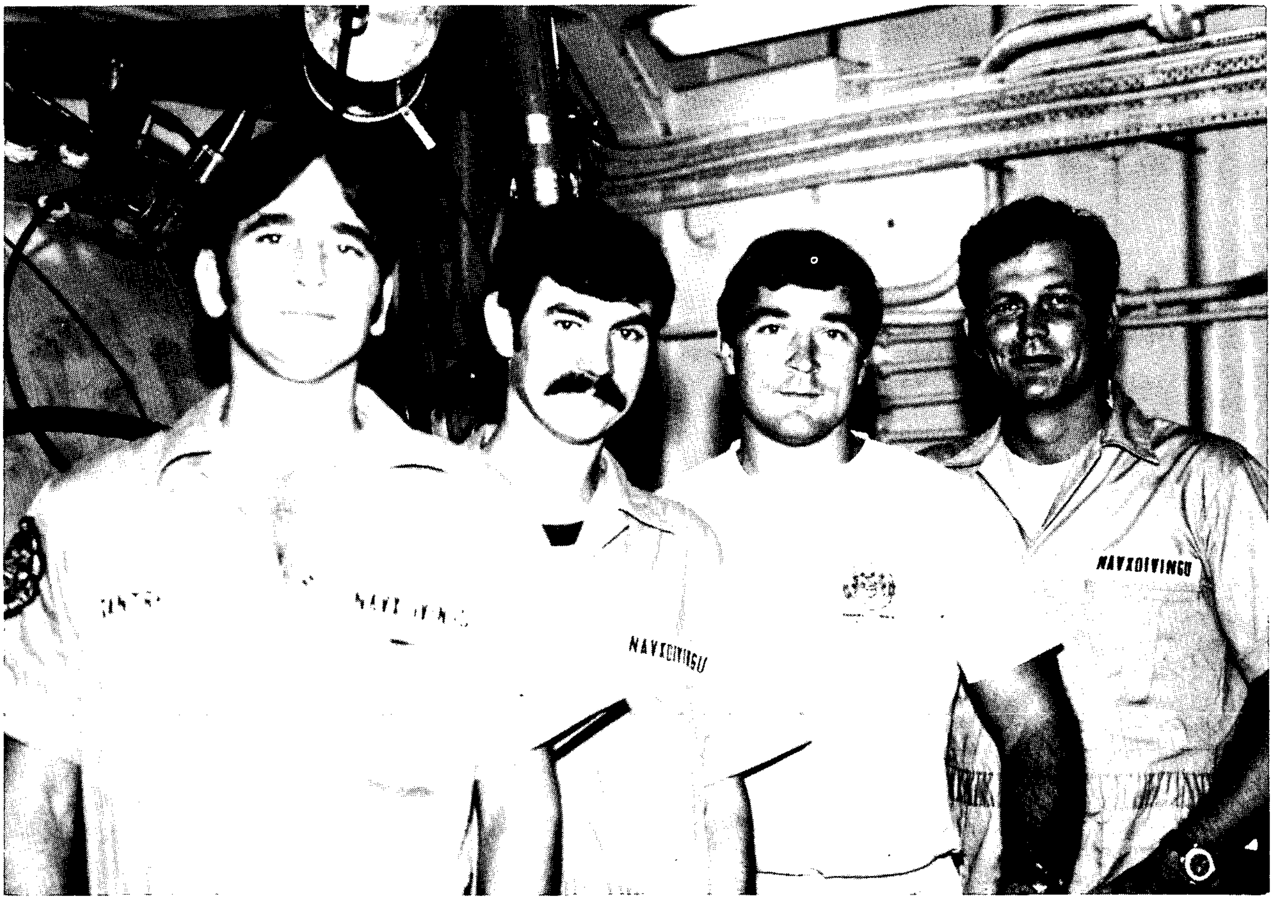
CLANSMAN comfortably accommodates a crew of 47, including 27 divers. Two Merchant Navy crews, who alternately man the ship on a month-on/month-off basis, are responsible to the Royal Navy for the ship's efficient operation and safe passage to and from the scene of operation.

The 27-man Royal Navy Diving Team is responsible for the safe operation and maintenance of the installed deep dive system and bell-handling arrangement and machinery.

CLANSMAN's stern has been fitted with a hydraulically-operated "A" frame to enable her to launch and recover one-man submersibles.

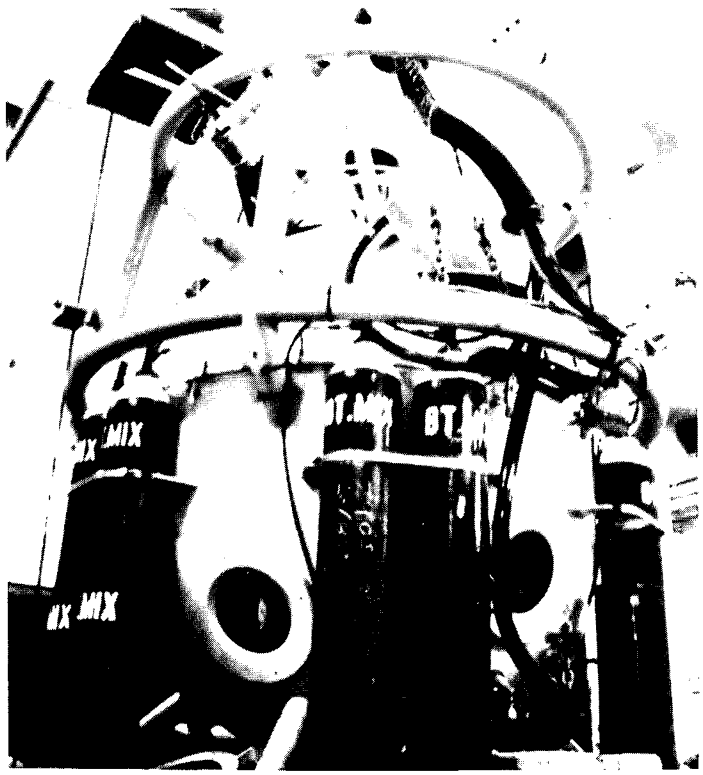
CLANSMAN's high maneuverability is advantageously utilized during mooring operations using her constant-tension-winch system. In fact, it is possible for her skipper to singlehandedly lay and recover a four-point moor from the pilot house during periods of heavy weather when it would be ill-advised to have working hands on deck.

CLANSMAN's dive system, built to current, state-of-the-art, commercial diving standards, consists of a



Left: M/V SEAFORTH CLANSMAN in four-point moor. Above (l-r): NEDU divers EN2(DV) Cantrell, EMC(DV) Sykas, BM1(DV) Bouchey, and BMC(DV) Larson.

Right: Diving bell aboard M/V SEAFORTH CLANSMAN.



three-chambered complex: two deck decompression chambers (DDC's), one with an outer lock, both of which are individually bolt-flanged to a transfer lock. Each DDC can accommodate four divers to a maximum depth of 305 meters-of-seawater (1,000 feet-of-seawater [FSW]). From the top of the transfer lock extends a transfer trunk, to which a Submersible Decompression Chamber (SDC), or diving bell, mates. The bell is capable of carrying two divers and a bell operator to and from the seabed work site guided by a constantly-tensioned guy wire to a deployable 6-ton clump. The handling system can transfer the bell from a fully mated condition to the water's

Summary of U.S. Navy Diver Involvement in Royal Navy Saturation Dives:
7 September to 11 October 1981

NEDU Divers:	Date of Sat Dive	Depth of Sat Dive	Total Time of Sat Dive	Dive Location
BMC(DV) S. Larson	7-17 SEP	70 MSW	240 hr 59 min	Coastal Waters,
EMC(DV) P. Sykas	7-17 SEP	70 MSW	240 hr 59 min	Falmouth, ENG, U.K.
BM1(DV) D. Bouchey	23-30 SEP	60 MSW	176 hr 03 min	Coastal Waters,
EN2(DV) R. Cantrell	23 SEP-11 OCT	60 MSW	438 hr 02 min	Plymouth, ENG, U.K.

edge through a 14-foot square casing passing vertically up through the hull (the moon-pool), inside 10 minutes.

The first dive in which NEDU's divers participated was conducted in 70 MSW about 12 miles south and seaward of the coastal town of Falmouth, Cornwall, in the southwest approaches to the English Channel. The Dive Team consisted of: CPO(D) Cook, RN; BMC(DV) Larson, USN; EMC(DV) Sykas, USN; LS(D) Kelly, RN; LS(D) Davies, RN; and LS(D) Roberts, RN. The dive pressed on 7 September and surfaced 17 September. The purpose of the dive was primarily to carry out underwater filming of the JIM 1-atmosphere diving suit. The JIM Suit used is one of two owned by the RN and one of approximately 20 currently operating world-wide in the offshore oil/gas industry with a depth capability of 2,000 FSW. During the dive, numerous diving support systems, machinery and underwater work techniques were exercised in preparation for the second sat dive.

The second Dive Team consisted of: FCPO(D) Dadds, RN; CPO(D) Coldwell, RN; PO(D) Underwood, RN; BM1(DV) Bouchey, USN; EN2 (DV) Cantrell, USN; LS(D) Pritchard, RN; LS(D) Alexander, RN; and LS(D) Piper, RN.

The second dive to 60 MSW commenced 23 September and surfaced 11 October. This dive was a dual-purpose operation. First, the divers observed and filmed MANTIS—a small, one-man mini submersible, maneuvered by thrusters and having a depth capability of 2,000 FSW. MANTIS is capable of performing various tasks with interchangeable manipulators while hovering stationary. Secondly, they conducted a salvage survey of Ex-HMS HOLLAND after its exact position was determined by HMS KIRKLISTON (a Royal Navy Minehunter). HOLLAND is an early British submarine which accidently sank in 190 FSW while under tow 10 miles south of Plymouth, England, off the Eddystone Light in 1915.

The second dive was plagued from the onset by heavy weather and material problems. The bad weather was in the form of 8- to 10-foot seas and 35- to 50-knot winds. Despite the weather, CLANSMAN demonstrated extremely good position-keeping characteristics with its 2,000-kilo Bruce anchors, constant-tension winches, and bow and stern thrusters.

The material problems arose from saltwater intrusion into the hydraulic handling system, which was promptly corrected by a factory representative during a planned gas-loading operation alongside in Plymouth.

Upon completion of the second dive, CLANSMAN sailed across the English Channel for a port call and long weekend in Caen, France, before returning to Portsmouth, her homeport. The NEDU contingent returned to NEDU on 21 October, all well and feeling privileged and culturally richer for having had the experience to dive with another navy under real operating conditions. Fully integrated participation of our divers in all aspects of diving and manning CLANSMAN's deep dive system enabled both the RN and USN to benefit in operational saturation working diving experience during this worthwhile exchange.

The Old Master

FAMILIARITY BREEDS CONTEMPT

I'm sure you've all heard this phrase; but, how many of you really understand its meaning? As divers, maybe you thought it pertained to the other guy and not directly to you.

I believe (regardless of what the accident reports have to say) that the majority of diving or diving-related accidents are caused by someone's carelessness. Not because someone didn't know what he was doing, but because he thought he knew the job so well and did it so often that he didn't need to or have to bother with the TRIED AND PROVEN, step-by-step Operating Procedures (OP's) and PMS Cards.

In case some of you younger divers don't know it, and if you old timers have forgotten it, OP's were developed and incorporated into the Navy Diving Program because a diver lost his life—accidentally!

I know none of you would intentionally hurt your fellow divers or yourselves. But, if you become over-confident or allow yourself to be lulled into a false sense of security because you've managed to do the same job many times over without the OP (and nothing's gone wrong before), the odds are going to catch up with you sooner or later. Then, unfortunately, at the very least, there'll be another accident report to fill out and submit.

Our Navy Diving Program has an excellent safety record to date, but we can't afford to spoil it with complacency. It only takes a shortcut at the wrong time to turn a routine diving job into a catastrophe. A lot of experienced people have spent many hours to produce and prove our OP's and PMS Cards, realizing that no one is perfect and can remember everything all the time. The more familiar you become with a particular job, the more inclined you are (probably unconsciously) to skip the OP or parts of it. If we're going to continue our present safety record, we have to constantly think OP's and use them fully and always. And if they're not correct because of equipment or condition changes, then the proper steps must be taken to make them right as soon as possible. It's a great deal easier to take the time to do something properly and safely than it is to have to go through an accident investigation, fill out an accident report, or—much worse—have to explain to someone's wife or mother why her husband or son became a diving fatality!

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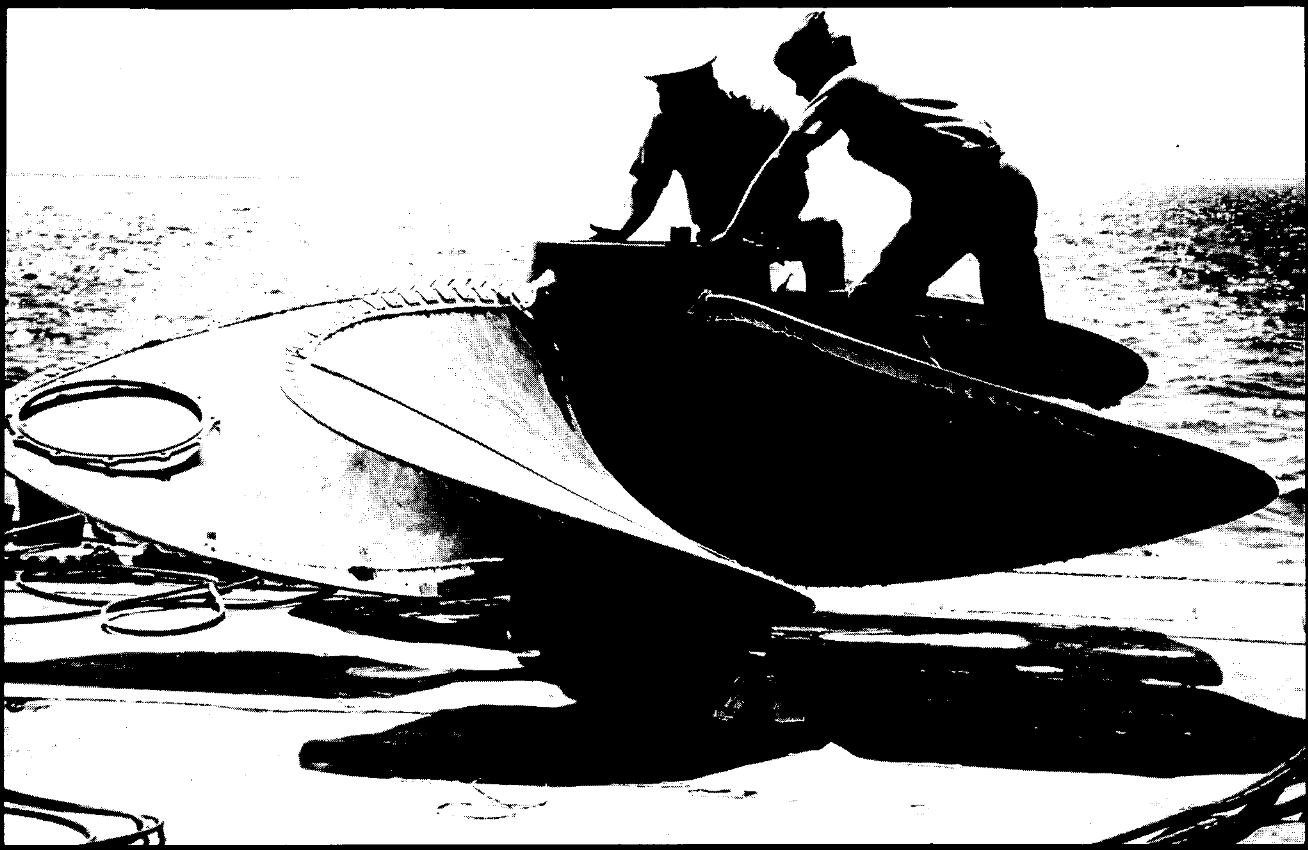

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