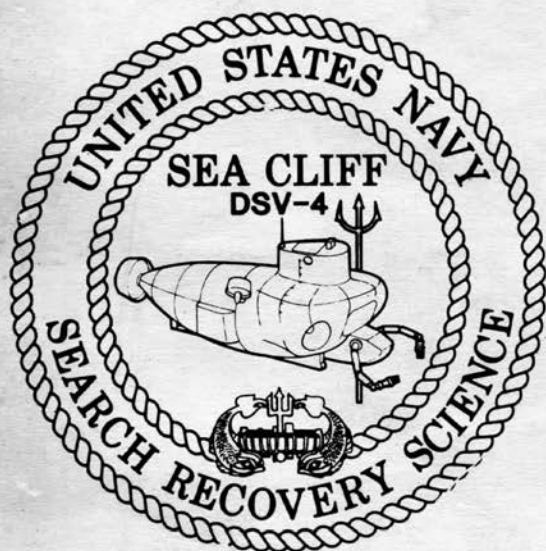


WELCOME ABOARD



**SEA CLIFF (DSV-4)
DEEP SUBMERGENCE VEHICLE**



**20,000 FOOT CONVERSION
AT
MARE ISLAND NAVAL SHIPYARD**

CAPABILITIES

SEA CLIFF is a 31.5 foot, 58,000 pound, three-man submersible capable of operating at depths approaching 4 miles. SEA CLIFF is used primarily for deep ocean object recovery, search, and scientific research.

Classified as a "manned, non-combatant, untethered submersible", the new 20,000 foot ("20K") capability will allow access to over 98% of the world's ocean floor. This "inner-space ship" will now have the capability to explore an area roughly six times the surface of the moon.

SEA CLIFF is powered by silver-zinc batteries that energize her electrical systems and side-pod propulsion units. These side pods are trainable through 360 degrees and provide exceptional maneuverability. The batteries also energize two hydraulic power units that power the stern propulsion unit for cruising along the sea floor as well as a variety of other functions. The two electro-hydraulic manipulators can be fitted with a variety of tools including a drill, a cable cutter, scissor and parallel jaws for retrieving small objects from the sea floor.

SEA CLIFF is also equipped with: a television camera with a video recorder and monitor; lights; 35mm still camera; obstacle avoidance and search sonar; gyrocompass; fathometer; and underwater and surface communications. Her life support system has an endurance that far exceeds the 16-hour mission profile.

In the event SEA CLIFF should become trapped or damaged while submerged, several unique emergency features exist which will enable the crew to return the vehicle safely to the surface. These emergency systems provide the ability to jettison weights, the two manipulators and both batteries, as well as a backup electrical power source for communications and life support. Any component or system that affects the ability to safely return the vehicle crew to the surface is tightly controlled by the "Scope of Certification". Exacting, nondeviation design and maintenance standards ensure the reliability of these systems. There is no margin for error in the business of deep submergence.



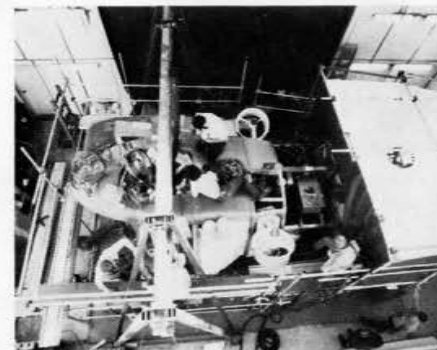
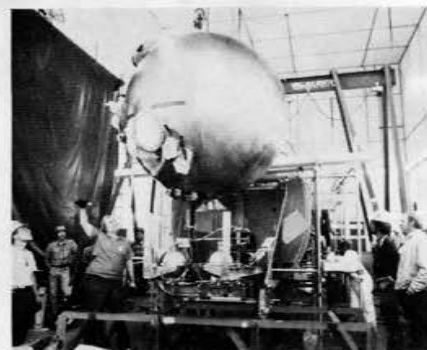
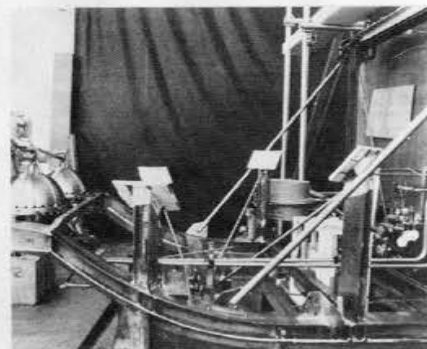
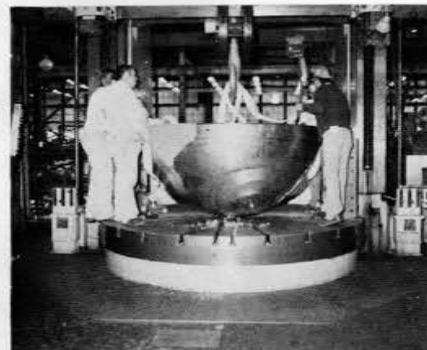
HISTORY

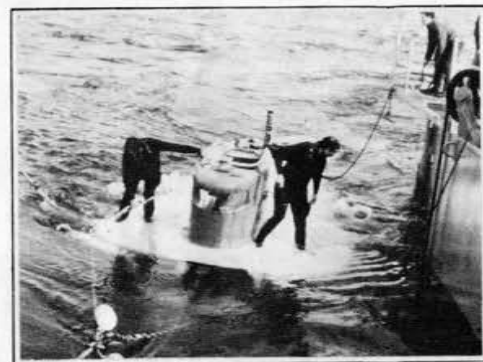
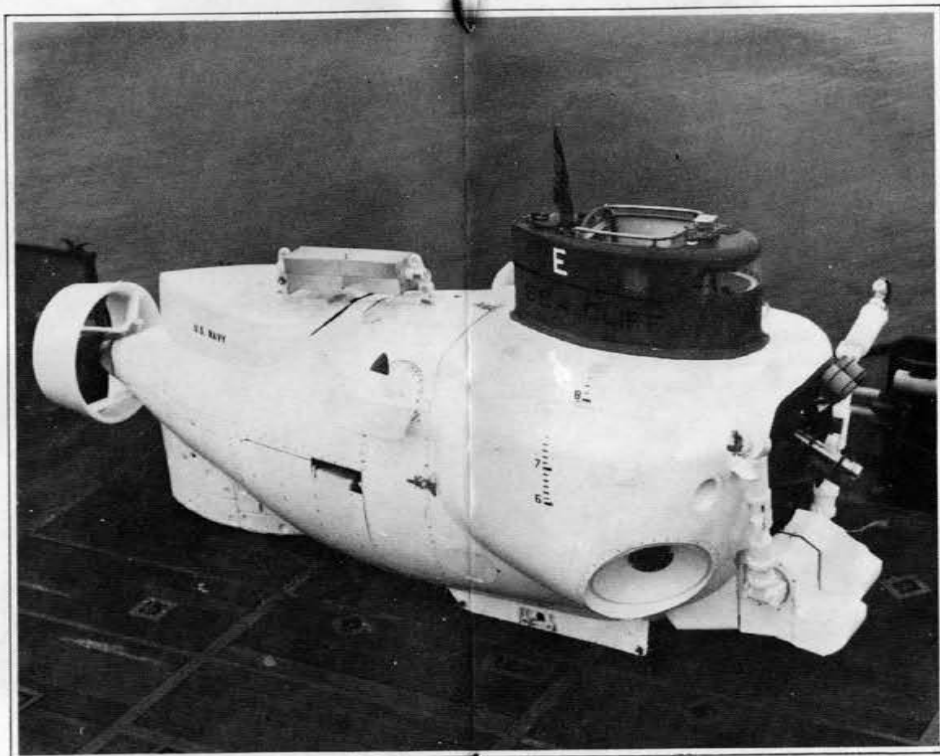
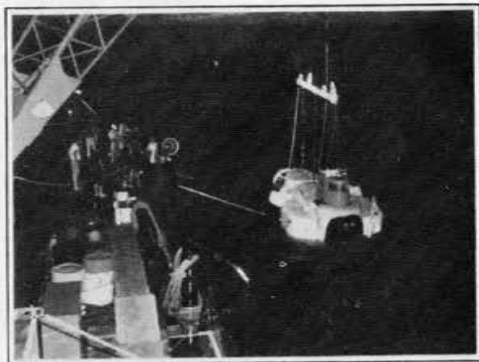
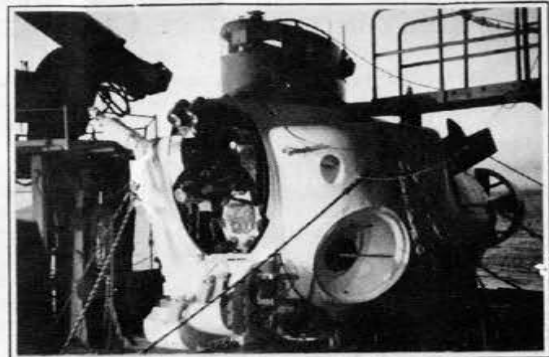
Initially designed and built by the Electric Boat Division of General Dynamics Corporation at Groton, Connecticut, SEA CLIFF (DSV-4) and her sister submersible TURTLE (DSV-3) were launched on 11 December 1968. Following initial shakedown and acceptance by the Navy, SEA CLIFF became a unit of Submarine Development Group ONE in San Diego, California. SEA CLIFF conducted missions as deep as 6,500 feet for 14 years.

In June 1983 she began an extensive conversion at Mare Island Naval Shipyard, Vallejo, California. The conversion included the detailed design and qualification of each system and component on the submersible for service to a depth of 20,000 feet and featured a new titanium personnel sphere and titanium vehicle frame.

Following sea trials in 1984, SEA CLIFF will become the world's deepest-diving operational submersible and will relieve TRIESTE II (DSV-1) as the nation's 20K deep ocean recovery asset.

20,000 FOOT CONVERSION AT MARE ISLAND NAVAL SHIPYARD





SEA CLIFF OPERATIONS
PRIOR TO 20K CONVERSION
AT
MARE ISLAND NAVAL SHIPYARD

A DAY IN THE LIFE OF A DEEP SUBMERGENCE CREWMAN

SEA CLIFF is designed to carry an operational crew of three to the ocean floor to conduct assigned missions. The dive is the culmination of the efforts of the entire crew during maintenance and pre-dive checks. The interior of SEA CLIFF's personnel sphere resembles a space capsule and is just slightly under 6.5 feet in diameter. It is packed full of a myriad of equipment necessary to control and monitor the operations of this sophisticated machine.

On a typical dive day, our crewman is awakened at 0500 to prepare for the 0900 launch. Following breakfast he reports to the Chief-of-the-Boat for his assignments. Today he will be the co-pilot and will pre-dive the vehicle along with the pilot. This procedure is similar to pre-flight checks on an aircraft and takes three hours on SEA CLIFF. When all systems have checked out satisfactorily, he meets with the mission pilot and SEA CLIFF's skipper to review the check list and the mission profile. Prior to the dive, the co-pilot will brief the observer on safety and casualty procedures and operational necessities including the wearing of insulated clothing, restricted items and sanitary waste disposal. When this has been completed, the crews of the support ship and DSV man their launch stations and the Pilot, Co-Pilot and observer enter SEA CLIFF and shut the hatch.

Once a "condition normal" report is received from SEA CLIFF, she is launched with two swimmers topside for final checks. With final checks complete and topside clear, the vents are opened. Water replaces the air in the ballast tanks and SEA CLIFF starts her long trip to the bottom.

During the descent, as well as throughout the dive, the pilot and co-pilot continuously monitor all systems for any abnormal indications. After approximately 2 1/2 hours of descent, or 1000 feet above the bottom, descent weights are dropped and the vehicle ballasting is adjusted for a neutral trim. After a cautious bottom approach, SEA CLIFF reaches the ocean floor and commences her mission. Endurance on the bottom can vary, but generally will be six to eight hours.

When the mission is successfully accomplished, or when diminishing battery power dictates terminating the dive, ascent weights are released and SEA CLIFF starts her 3-hour ascent to the surface.

Once on the surface and recovered onboard the support ship, our Deep Submergence Crewman completes a thorough post dive checkout and discusses the day's operations with the pilot and SEA CLIFF's skipper. The entire crew then works together to ready SEA CLIFF for her next dive.

SEA CLIFF (DSV-4) CREW

Assistant Officer-in-Charge
LT E. C. LONG, USN

Engineer Officer
LTJG P. T. O'BRIEN, USN

Chief of the Boat
EMC(SS) W. B. COX, USN

Certification Officer
ETCM(SS) M. E. KAUFMANN, USN

Assistant Engineer Officer
MMCS(SS) W. L. SHIPMAN, USN

MM1(SS) T. R. OWEN
EM1(SS/DV) W. T. PINE
ET1(SS) D. H. ATCHISON
MM1(SS) M. A. NORRIS
EM1(SS) W. G. MAGNESS
STS1(SS/DV) W. H. KINGERY
IC2(SS) S. V. ROBICH
ET2(SS/DV) C. E. JOHNSON
FN(SU) D. L. MCKISSACK



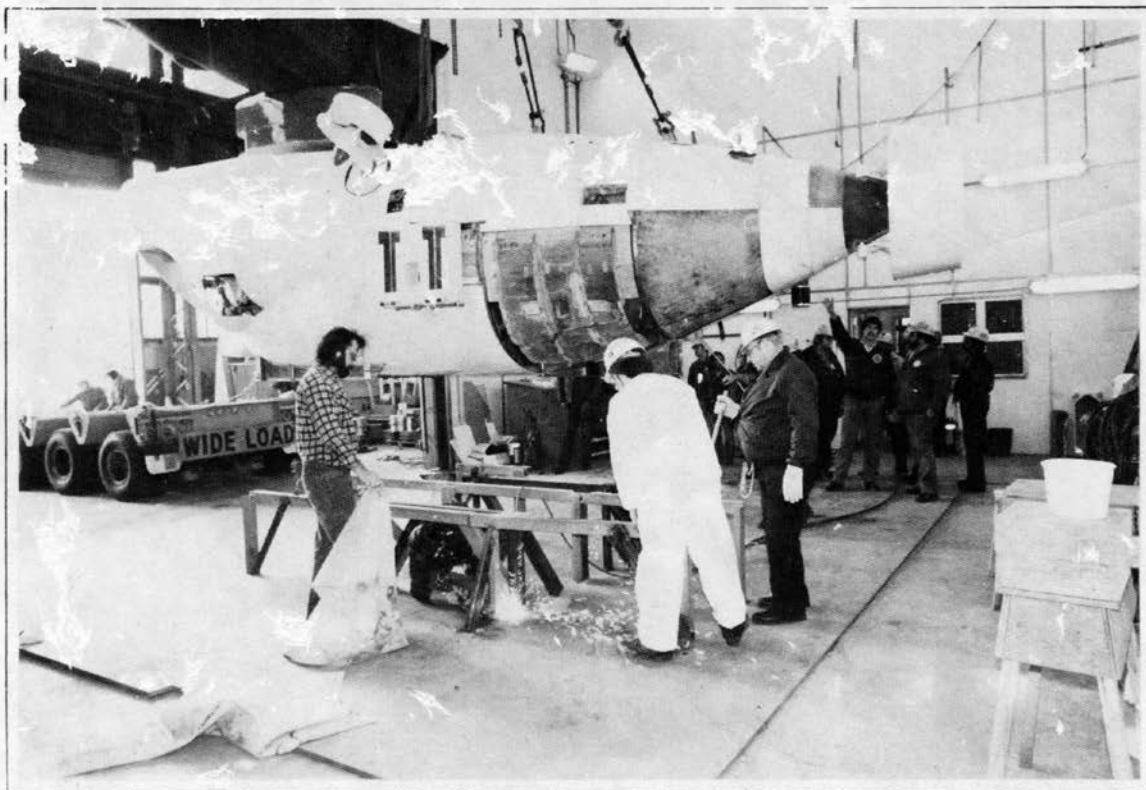
LIEUTENANT COMMANDER RICHARD B. WILLIAMS, USN OFFICER-IN-CHARGE

Lieutenant Commander WILLIAMS was commissioned in 1975 through the Naval ROTC Program, after completing five years of civil-ocean engineering studies at Oregon State University. Following graduation from the Deep Sea (He02) Diving Officer Course in Washington, D.C., Surface Warfare Officer School, and Naval Deep Submergence School, he served aboard USS PIGEON (ASR-21) where he qualified as Surface Warfare Officer and Saturation Diving Officer. During his three-year tour, he served as Communications/Rescue Control Officer, Ship's Bosun, Damage Control Assistant, Acting Engineer, and Operations Officer. Lieutenant Commander WILLIAMS served in PIGEON during the operational evaluation of the Deep Submergence Rescue System and the certification of Deep Diving System Mark 2 Mod 1, and was selected as a designated material support subspecialist in Naval/Mechanical Engineering.

Selected for lateral transfer to the submarine force in 1979, Lieutenant Commander WILLIAMS attended Nuclear Power School, Nuclear Prototype Training, and the Submarine Officer Basic Course. In 1980, he reported to USS SEAWOLF (SSN-575), where he served as Reactor Controls Assistant and Damage Control Assistant. During his tour in SEAWOLF, he qualified in submarines and as a nuclear propulsion engineer, while completing two Pacific Fleet deployments. On 17 June 1983, he relieved as Officer in Charge of Deep Submergence Vehicle SEA CLIFF (DSV-4). Lieutenant Commander WILLIAMS assumed command of SEA CLIFF as she commenced an extensive conversion from 6,500 foot to 20,000 foot depth capability.

Originally from Cincinnati, Ohio, and a long-time resident of Oregon City, Oregon, Lieutenant Commander WILLIAMS is the son of Fran Williams and the late F. Duane Williams of Portland, Oregon.

20K SEA CLIFF AFTER CONVERSION



AT
MARE ISLAND NAVAL SHIPYARD