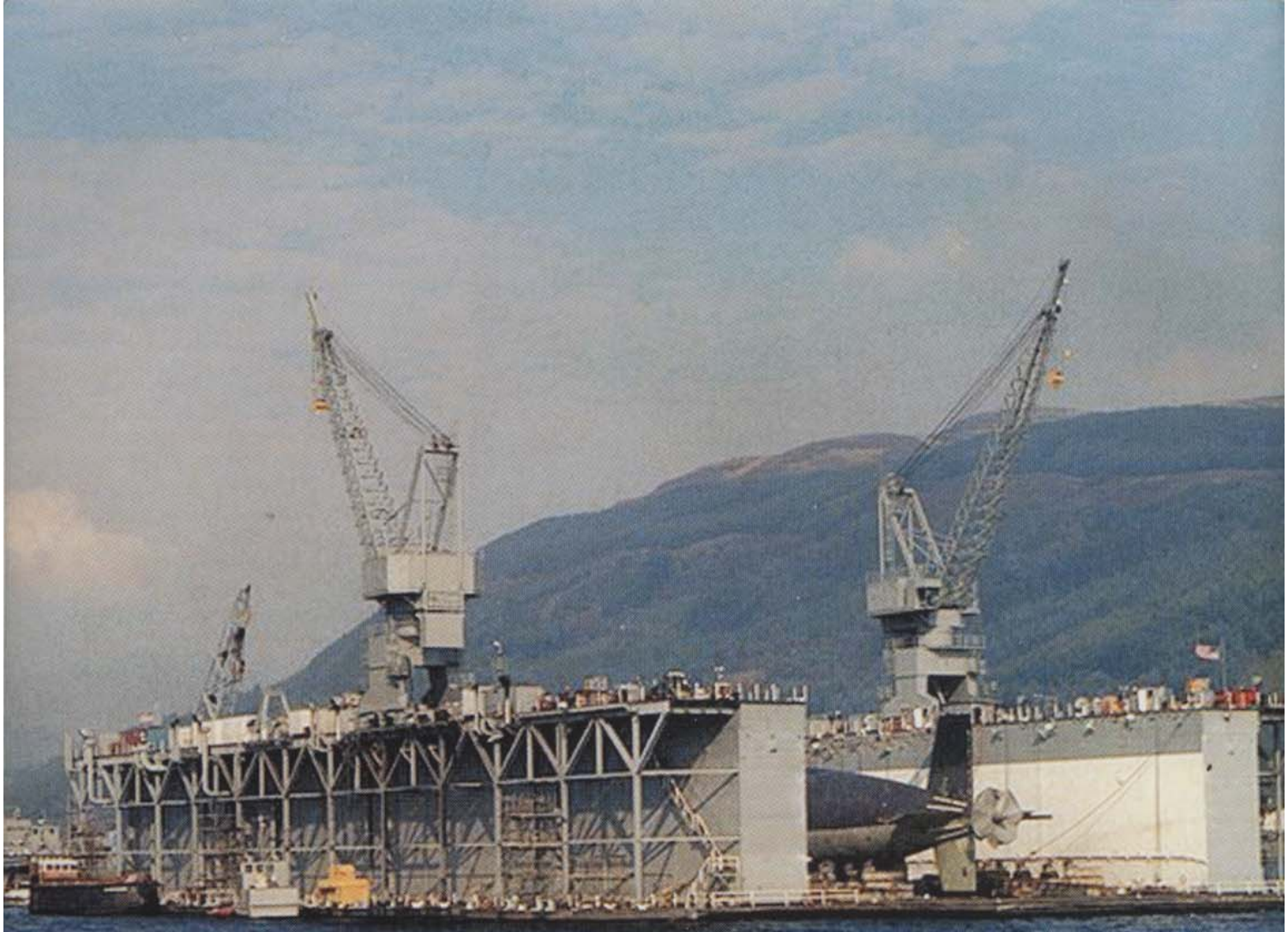


COLD WAR MILESTONES
REMEMBERING HOLY LOCH

A bastion of immense US Naval strength was quietly located in the backwaters of Scotland

BY FREDERICK GOULD

The drawdown of the United States armed forces is far more than the elimination of hardware and the retirement of formations. It is more than reducing the number of people, both in uniform and civilians employed by the defense industry. It is occasionally a drastic change in the way that a vital mission is accomplished with fewer resources and possibly the end of an era. Such is the history of the United States Submarine Refit Site at Holy Loch, Scotland. The Cold War gave it life and the collapse of the Soviet Union ended it. Now, Holy Loch is just another closed base that lives only in the memory of

The floating drydock USS *Los Alamos* (AFDB-7) at Holy Loch, Scotland, provided on-site maintenance around the clock to keep the ballistic missile boats serviced. During the height of the Cold War with Soviet Russia, the missile boats provided America's major means of instant retaliation in case of enemy nuclear attack. With three such remote floating bases like Holy Loch strategically located around the world, the US Navy was instantly able to launch dozens of long-range nuclear warheads which would have obliterated the Soviet Union. It is felt this threat alone served to negate any thought of major aggression on the part of Soviet Russia.

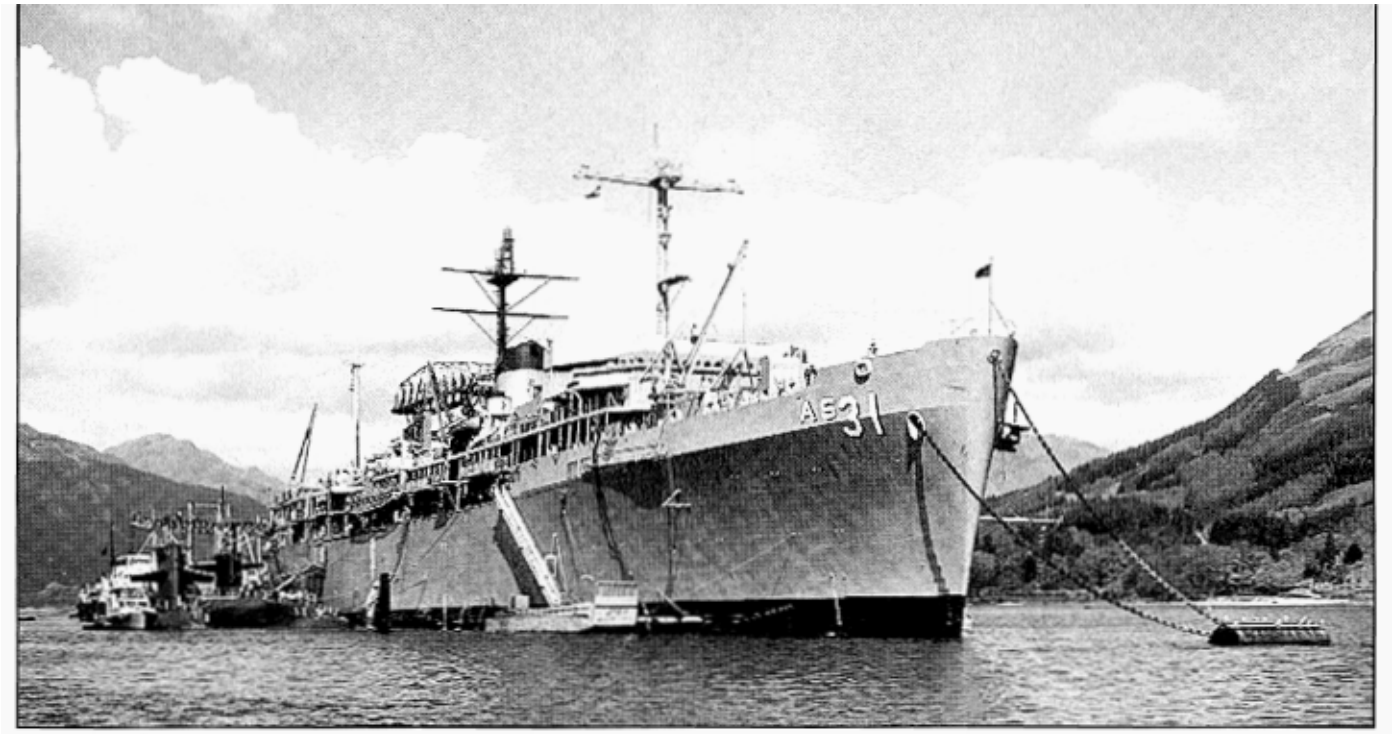
its veterans and local neighbors.

Throughout the Cold War, the security of the United States was based on the Mutual Assured Destruction (MAD) doctrine. Under the MAD concept, the ability of the United States to retaliate in the event of nuclear attack was and is still based on the Nuclear Triad. The Nuclear Triad consists of manned penetration bombers, land-based missiles and sea-based missiles. The thought behind the triad is that, regardless of any technological breakthroughs in a potential adversary's arsenal, at least one

A good view of the tender *Proteus* loading a missile from its gantry crane into the ballistic missile submarine USS *Patrick Henry* (SSBN-599) at Holy Loch, Dunoon, Scotland, in 1961. All work was accomplished aboard the ships with virtually no support from the Scottish mainland.

The USS *Thomas Jefferson* (SSBN-618) was the last of five 6955-ton *Ethan Allen*-class fleet missile submarines expressly designed from the keel up in 1958/1959 to launch 16 modern ICBM missiles like the Polaris A-3. Slow but reliable, they were soon replaced by the larger 7200-ton *Lafayette*-class SSBNs.

At 13,480-tons, the USS *Simon Lake* (AS-33) was the smallest of the tenders to serve in Scotland's waters. The Holy Loch submarine base closed on 3 March 1992 with the *Simon Lake's* final departure. With her went more than two decades of nostalgic Cold War history as a tense era in geo-politics came to a close with Soviet Russia's collapse. With all guns removed, the *Simon Lake* was later converted to support the Trident missile program.



The US Navy nuclear submarine mooring at Holy Loch provided an idyllic sheltered cove which was strategically located to allow Polaris submarines to get "on station" in the shortest possible time. The 10,500-ton submarine tender USS *Hunley (AS-31)* was modified from a Polaris to Poseidon missile support ship in 1975.

part of the Triad will still provide the United States with the ability to respond with overwhelming force to any nuclear attack. The fact that the United States could respond to any nuclear attack with devastating force has always been well-publicized. The sea-based portion of the triad has always been the least susceptible to destruction by opposing forces.

The first operational submarine-launched ballistic missile utilized by the US Navy was the Polaris (Al). As there was an urgent requirement for the weapon system, it was brought from concept to an operational unit in less than 6-yrs. In September 1955, the Secretary of Defense ordered the Army and Navy to develop land- and sea-based strategic missiles with a minimum range of 1500-mi. The 1500-mi range was driven by the need to be able to strike Soviet targets from existing NATO installations. The Army's contribution was the liquid-fueled Jupiter. The Navy, rather than use a Navalized version of the Jupiter was to produce the solid-fueled Polaris.

Even though liquid-fueled missiles have advantages such as low cost, simple construction and high thrust, the fuel is difficult and dangerous to handle. They are problems that would be too dangerous within the confined space of a submerged submarine's hull. Recognizing the inherent problems with liquid fuel, the Navy developed the solid-fueled Polaris specifically for use on board submarines. To increase the security of the strategic missile platform, it was decided to design the system so that launches occurred submerged.

The reasoning was that detection would be much simpler for the adversary if the boats had to sit on the surface while firing. Even though it was a rapid deployment of a radical weapon system, the program was a complete success. Equipped with a single reentry vehicle and a maximum range of 1200-mi, it provided the sea service with a viable strategic weapon. As the 1200-mi range was short for a strategic weapon, it was wisely decided to deploy the existing missile and continue research to rectify the range problem. When you consider the difficulties involved with developing a new concept weapon system, Polaris was a outstanding success.

By itself, the weapon was useless. It needed a submarine that could allow for its proper employment. The answer was in the form of the *Skipjack* (SSN-585) class of nuclear-powered fast-attack submarines which were currently under construction. Uncompleted fast-attack boats were modified by cutting the hull in half. A 130-ft extension was inserted that contained two rows of eight vertical missile tubes, fire control systems, inertial navigation systems and auxiliary machinery required for the storing, testing and launching of the strategic Polaris weapon. The first successful launch occurred on 20 July 1960 by the USS *George Washington* (SSBN-598). The coupling of the Polaris missile with the existing submarines ranks as one of the most-successful military programs of all time.

Although a 1200-mi range for a weapon was very long by 1960 standards, it had to be increased for one very important reason. It limited the area of the ocean that Soviet antisubmarine forces had to search to locate the ballistic missile submarines. Therefore, the Polaris Al was followed by the improved A2 with a range of 1500-mi. The A2 was still equipped with a single reentry vehicle, a severe limitation. The A3 version increased the payload to three reentry vehicles. That action tripled the number of targets that one submarine could attack. The improved missiles were back-fitted into existing FBM submarines, saving both time and money.

Improvements in the Soviet defenses required a still-longer-ranged weapon to further complicate search problems. That resulted in the development of Poseidon, with a range of 2500-mi and a payload of ten reentry vehicles. The Poseidon submarines were the most-powerful weapons system to be deployed by man. One submarine commanding officer was responsible for more

explosive fire power than was expended by all belligerents during WWII. The survival of just one submarine could rain ruin upon any potential attacker, ensuring a hollow victory. During the 1970s and 1980s, the deterrent patrols ensured that nuclear war was not a winning proposition.

Although it is stated that nuclear power gives a warship unlimited endurance, it is still finite. A nuclear power plant's uranium core is capable of supplying only so much power before it requires replacement. Core life is determined by factors such as the distance and speed that a ship "steams." Because of the enormous costs associated with nuclear reactor refueling, the evolution is planned on a 10-yr cycle. If the range a submarine must travel before it is on station and capable of striking targets is reduced, fewer boats are required to provide coverage.

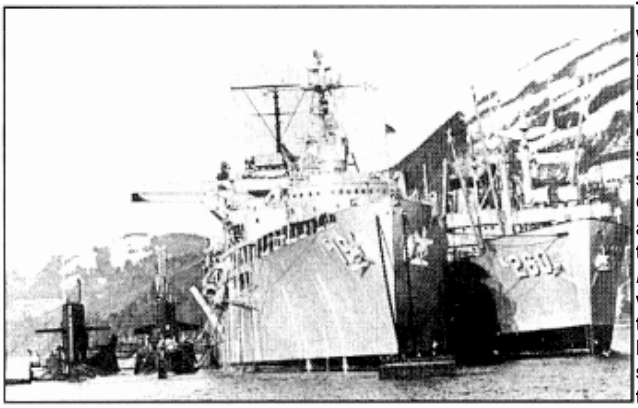
Fewer boats translates to fewer sailors, less shore support, fewer bases, and ultimately, reduced cost. As both the Polaris and Poseidon missiles were relatively short-ranged weapons, it was imperative that their effectiveness be maximized. The only way was to increase the numbers of submarines on station at one time. The quickest way to minimize transit time was the use of overseas bases. The result was that three overseas bases for ballistic missile submarines were established; Apra Harbor, Guam; Rota, Spain; and Holy Loch, Scotland.

One fleet ballistic missile submarine squadron was assigned to each base. A fourth squadron was established in Charleston, South Carolina. That resulted in a total of 41 Fleet Ballistic Missile submarines and five tenders. Additionally, two T-AK supply vessels were procured. Their function was to replenish the forward-deployed squadrons in Scotland, Spain, and Guam. They were configured to transport food, spare parts, torpedoes and missiles. Space to transport missiles and torpedoes was mandatory as both are complex weapons systems that require periodic maintenance and overhauls. While most maintenance can be performed by the tender, complex, periodic overhauls require a Stateside depot.

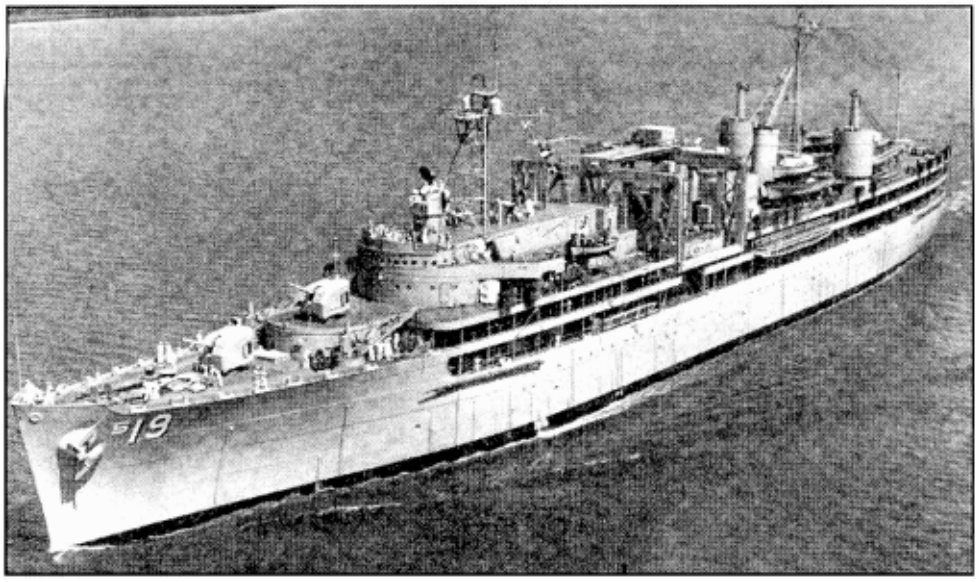
To reduce costs, each submarine had two crews. That practice is still in effect today with modern boats. Even though manpower costs are greater for each individual submarine, with two crews, a boat spends much more time on patrol. More time on patrol translates into fewer submarines and, ultimately, less cost. The two crews are called the Blue Crew and Gold Crew. Each crew is fully independent. While one crew takes the boat on patrol, the other is back in home port either in training or on leave.

The Holy Loch submarine base was established on March 1961 by the arrival of the first station tender, USS *Proteus* (AS-19). The era of deterrent patrols from the Holy Loch refit site began in the same year by the departure of the USS *George Washington* (SSBN-598) on a deterrent patrol. Throughout the intervening years, hundreds of strategic patrols departed from, or terminated at the Scottish site. Submarine crews were not homeported in Scotland. Keeping the crews there would require too much shore support. The idea was to keep the forward submarine bases as austere as practical. Crews would fly in from Stateside bases, such as Charleston or New London, relieve the returning crew, take the boat through refit, and then back out on patrol. In addition to providing more submarines on patrol at a given time, the extra personnel ensured a higher standard of material readiness on each boat.

The Holy Loch is located on the central western coast of Scotland. The body of water was so named because



The tender *Proteus* (AS-19) was kept well-supplied with a full bill of stateside goods including everything from tasty ham hocks to electronic circuit boards thanks to the shuttle service between the support squadron at Charleston, South Carolina, and Holy Loch provided by the supply ship USS *Betelgeuse* (AK-260). *Proteus* was the first submarine tender sent to Holy Loch in March 1961. Like the submarines they served, the tenders were periodically rotated for overhaul and R&R.



Originally built as a 10,100-ton *Fulton-class* submarine tender, USS Proteus (AS-19) was launched late in 1940 at Mare Island. After extensive wartime service she was lengthened and converted to support Polaris missile submarines in 1959/1960. Later, she received a FRAM II refit to accommodate nuclear submarines. This early 1970s photo show *Proteus* still armed with her wartime battery of four *5-in/38s* in single mounts. Her guns were removed during a 1975 refit.

sometime in the Middle Ages, a rnerchantman carrying a cargo of sand from the Holy Land sank in its cold, dark waters. According to local legend, the sand was to have been used for the construction of a local church. The Loch is surrounded on three sides by high hills providing a safe anchorage from the rough weather that is so prevalent in this area. The tender and submarines were moored in the center of the Loch for a very good reason —security. By not mooring the ships to a pier, it made it far more difficult for terrorists or enemy agents to attack.

Access to the open ocean is down the River Clyde, to the Firth of Clyde. From that point, a submarine could go south to the Irish Sea, through St. George's Channel and to the Atlantic, or north through the North Channel and then the North Atlantic. The Firth of Clyde and the restricted waters of the Irish Sea and the channels enabled NATO forces to protect the arriving and departing submarines from interfering adversary forces. It also provided security as to in which direction the submarine was heading, not giving any clues as to the potential patrol area.

The base is so far north that it is light 18-hrs a day during the summer but only 6-hrs in the winter. It is so light during the summer that it is possible to read a newspaper outside at 2 am.

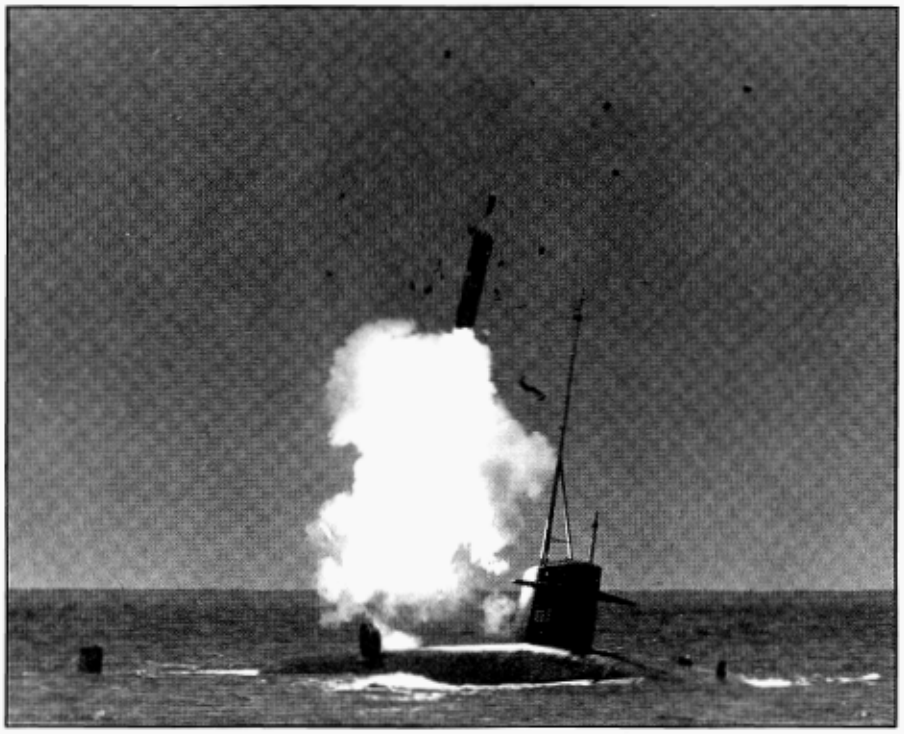
On many days, instead of true daylight, it is kind of' a gray, murky, light. The cold, damp climate necessitates the wearing of winter clothes almost year-round. The weather is much better than expected due to the influences of the Gulf Stream. Scotland is on the same latitude as Hudson Bay, Canada. As bad as Scottish weather is, it is far more hospitable than Northern Canada.

The weather and day length are insignificant when compared to the strategic location of the base. Poseidon-equipped submarines were within range of their targets as soon as they submerged on the beginning of a deterrent patrol. By basing the units in Scotland, there was virtually no transit time before a patrol started. That fact alone, made the base invaluable, as it was a force multiplier that usually could only be dreamed of. This location has been important for seafaring powers from the Vikings to the United States on an almost continuous basis. Many ruins remain from the Viking raids, a story by themselves. The Royal Navy maintained a submarine tender moored there during WWII and the early Cold War years.

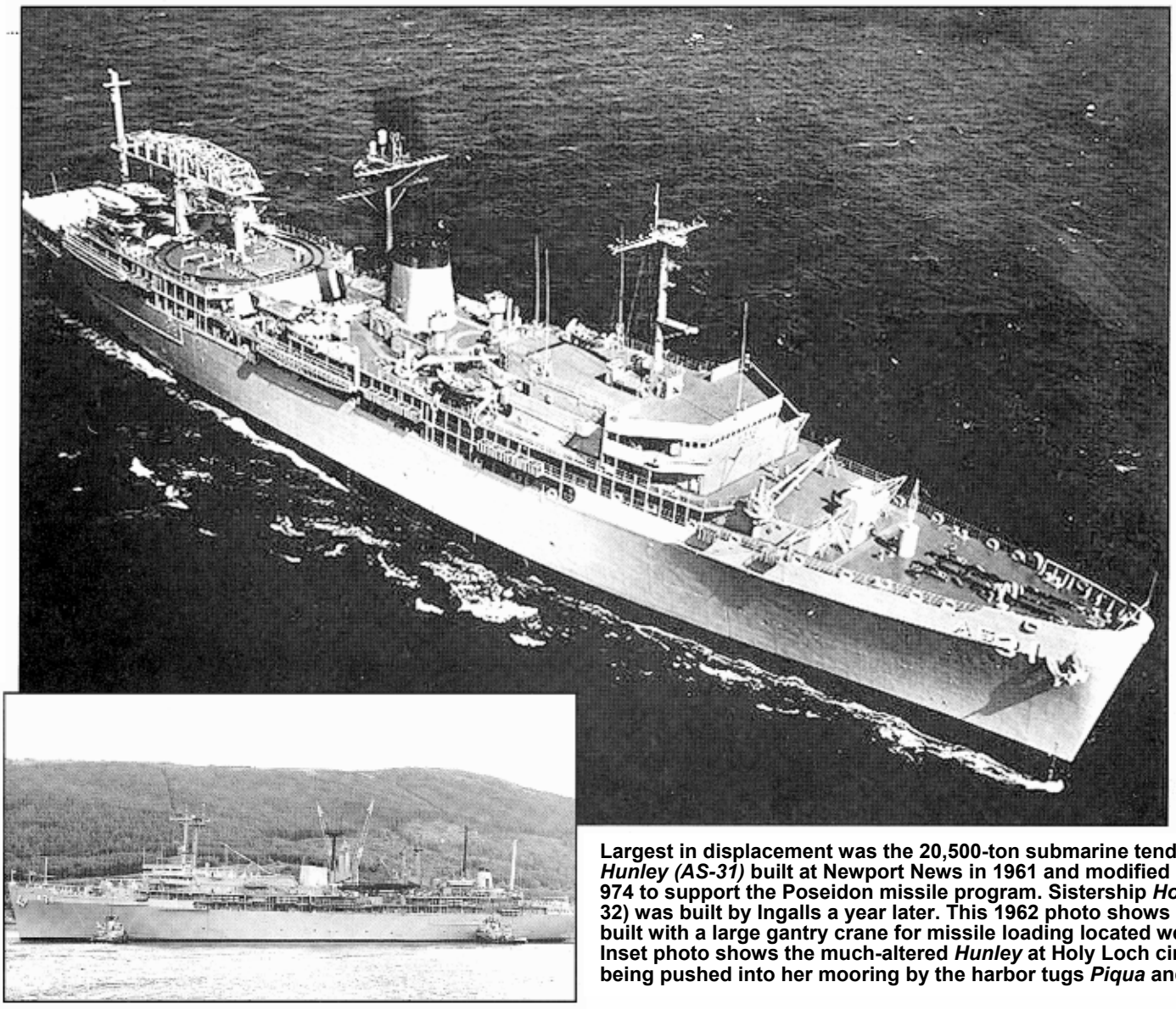
The central component of all four submarine squadrons is the submarine tender. Auxiliary ships, such as submarine and destroyer tenders provides the US Navy with unparalleled flexibility and endurance. A tender is a floating, mobile ship repair facility. Within its hull are all the repair shops, supply store rooms and weapons magazines required to support a warship. Space on board a warship is at a premium. Even an aircraft carrier is very crowded. Therefore, space for spare parts, material and repair shops is very limited on any ship. Periodically, submarines, destroyers, cruisers and amphibious ships require the support of a tender or shore-based facility for needed repairs and replenishment for spares.

All tenders are organized along relatively similar lines. They are arranged into several different departments for management purposes. Operations is responsible for the safe operation of the ship at sea. Communications and navigation are its area of expertise. Engineering Department is the tender's mobility. Main propulsion, steam generation, electrical generation, fresh water, sanitation, fire fighting and damage control are some of the areas that it controls. It will also provide power and water to any ship that is alongside for upkeep. Supply handles food service and the storage of repair parts and materials. Weapons Department has custody of all self-defense weapons systems and magazines. On submarine tenders, that will include spare torpedoes and missiles for the boats. Admin will have all administrative duties. The final department is the one that is the reason for the existence of the ship – Repair.

Repair Department performs repairs on both the mother ship and any vessels that come alongside. Tenders are classified as either a destroyer tender, submarine tender, or repair ship. However, they can and do provide services to any ship that requests them. Additionally, tenders will provide support to ships of other nations. To accomplish its mission, the department controls



The USS *Henry Clay* (SSBN-625) heels over 5-degrees to surface launch her Polaris missile during tests in 1964. Later in the day, she launched another Polaris underwater, which was the preferred procedure for SSBNs. The deadly ICBMs had a range of over 1500-mi. and could target three cities at once.



Largest in displacement was the 20,500-ton submarine tender USS *Hunley (AS-31)* built at Newport News in 1961 and modified in 1973/1 974 to support the Poseidon missile program. Sistership *Holland* (AS-32) was built by Ingalls a year later. This 1962 photo shows *Hunley as* built with a large gantry crane for missile loading located well aft. Inset photo shows the much-altered *Hunley* at Holy Loch circa 1990 being pushed into her mooring by the harbor tugs *Piqua* and *Natick.*

many complex shops. There are weld shops that are capable of repairs ranging from the replacement of piping to major hull work. Machine shops and foundries can refurbish metal parts or if need be, make them from scratch. There are also electrical shops that provide calibration and repair services. Any item from replacing a wall switch to a generator overhaul can be accomplished. Electronic shops are available to service communications, radar, electronic warfare and fire control systems. In essence, a tender is a one-stop, mobile service center for Naval vessels that is mobile.

The tender wasn't the only repair asset available at Holy Loch and the other refit sites. Submarine repair requires the services of a floating drydock. The drydock enables the submarine's hull to be repaired and painted. The presences of a drydock elevates a tender to the capability of a shipyard. The drydock assigned to Holy Loch was the USS *Los Alamos* (AFDB-7). Other assets included barges for additional office space and storage. A bantam fleet of small craft and tugs rounded out the site. The small craft were required to move personnel and supplies to shore. Tug boats were mandatory in the mooring of ships alongside the tender or drydock.

The USS *Will Rogers* (SSBN-659), has two "last" distinctions in her career that are of interest to any Naval history buff The first is that the *Rogers* was the last Fleet Ballistic Missile Submarine of the *Benjamin Franklin*-class to be commissioned. She was launched on 21 July 1966 and commissioned on 1 April 1967. Secondly, in 1991, the USS *Will Rogers* ended an era for the US Nay when it began the last deterrent patrol from Submarine Refit Site One, Holy Loch, Scotland. Sadly, due to budget reductions and a reduced threat of nuclear war, she was decommissioned in 1992.

Almost as a footnote, Submarine Refit Site One, Holy Loch, Scotland was officially closed on 3 March 1992 by the departure of the USS *Simon Lake* (AS-33) for Stateside duty. After that day, the submarines, tender, drydock, barges, and small boats, all departed, leaving an empty, but beautiful bay. The silent departure of the *Simon Lake* was far more than a ship and crew heading for home. It. was the closing of a historical era. No longer would Fleet Ballistic Missile Submarine operate from the Holy Loch. Although the nuclear deterrent mission can now be accomplished from Stateside bases, the loss of the Holy Loch has taken a great deal of adventure from the "New Downsized" Navy.