As the Cold War intensified in the decade following World War II, and particularly with the Soviet Union’s success in matching the United States in developing atomic weapons, nuclear deterrence became a key element of global diplomacy. By the early 1950s, both superpowers had deployed large manned bomber forces capable of reaching each other’s homelands with either forward basing or aerial refueling, and additionally, the United States had begun to deploy atomic weapons on aircraft carriers.

Both sides were also quick to take advantage of captured German V-1 and V-2 technology from World War II to begin development of both guided and ballistic missiles for tactical and strategic use, with the U.S. Army initially taking the lead in the United States. Not to be out-done, the U.S. Navy converted two World War II fleet boats, USS Carbonero (SS-337) and USS Cusk (SS-348) to carry a U.S. variant of the German V-1 pulse-jet missile, known as the Loon, first launched at sea in February 1947. Loon’s nominal range under command guidance was approximately 50 nautical miles, but using a second submarine as a relay, it could be effective out to 135 nautical miles, with a reported Circular Error Probable (CEP) of 6,000 yards.

By this time, the Navy had also let development contracts for two more ambitious bombardment missiles, the supersonic Grumman Rigel (SSM-N-6) and the subsonic Chance-Vought Regulus (SSM-N-8), each intended to carry a 3,000 pound warhead for 500 nautical miles. Although Rigel fell by the wayside in 1953, Regulus was successfully developed into America’s first sea-going nuclear deterrent and was first deployed on the heavy cruiser USS Los Angeles (CA-135) in 1955. Eventually, five submarines were fitted to carry and launch Regulus also, and they became the principal deterrent force.

The Regulus I missile itself was essentially a small turbojet aircraft, 42 feet long, with a wingspan of 21 feet. Gross launch weight was just under seven tons, including a ton of fuel, and its Allison J33-A-
1953

In mid-1956, it became Navy policy to keep one SSG in each ocean, and Tunny shifted her base of operations to Pearl Harbor in 1957. Meanwhile, the Navy had laid down two large diesel-electric submarines specifically to carry Regulus, launching USS Grayback (SSG-574) in March 1958 and USS Growler (SSG-577) in August of that same year. Each of these two near-sister ships – displacing approximately 3,600 tons submerged – could accommodate a total of four Regulus I missiles in a pair of cylindrical hangars set into the large, bulbous bow. These hangars opened aft
After the Soviet Union and then the United States successfully tested their first intercontinental ballistic missiles (ICBMs) in 1957, the nuclear arms race moved into a more dangerous phase. In late 1958, with four SSGs and four Regulus cruisers in commission, the Navy responded by moving all of the submarines and three of the cruisers to the Pacific to maintain regular deterrent patrols threatening the Soviet Far East. In particular, Submarine Squadron ONE was formed of the four SSGs at Pearl Harbor and adopted a readiness posture that put at least four missiles on station in the Western Pacific at all times, to complement existing carrier-based aircraft armed with nuclear weapons. (This required deploying either the two converted fleet boats together or one of the two Grayback s.) Tunny departed on the first of these regularly scheduled deterrent patrols in October 1959, whereas Grayback’s and Growler’s first patrols commenced in early 1960.

Some years earlier, though, the Navy had already directed Chance Vought to start developing a second-generation, supersonic Regulus II missile, capable or reaching 1,200 nautical miles at Mach 2. Nearly twice as large as Regulus I, the new weapon demanded a somewhat larger submarine to carry it. Several alternative platform designs were studied, including one capable of carrying four Regulus II or eight Regulus I missiles in a large hangar forward. Ultimately, funding for building a new SSG was included in the FY 1956 budget. Moreover, by late 1955, Navy long-range planners were anticipating that as many as 23 Regulus II submarines would eventually be required. Earlier that same year, however, the Navy’s nuclear propulsion program had come to fruition with USS Nautilus (SSN-571) “underway on nuclear power.” Consequently, the first planned Regulus II SSG was reordered as a nuclear-powered submarine, laid down at Mare Island in April 1957, and commissioned as USS Halibut (SSGN-587) in January 1960.

Halibut, 350 feet long overall and displacing nearly 4,900 tons submerged, was fitted with what was then the standard attack submarine power plant, driving two screws. Her enormous single missile hangar was set deep into the outer hull forward, and sloped upward and aft to penetrate the deck, where a large, vertically-opening door gave access to a turntable launcher forward of the sail. The hangar space could hold four Regulus II or five Regulus I missiles and also doubled as a forward torpedo room. This large, single-door hangar – potentially open to the sea during the launching evolution – constituted a serious vulnerability. If it flooded, the ship might easily sink.

Halibut entered active service with the Pacific Fleet in November 1960 and made her first formal patrol early the next year, joining the four SSGs in the rotation necessary to keep four strategic missiles continually on station. By then, the heavy cruisers had been withdrawn from the Regulus mission – with Los Angeles the last to go in 1961 – leaving the submarines to carry on alone. Somewhat ironically, even though Regulus II proved successful in final testing, budgetary pressures prevented any subsequent procurement, and it was never deployed. Thus, for the entire era of these
In fact, the synergy of two new military technologies – compact nuclear warheads, and large solid-fuel rocket motors – spelled a quick end to the Regulus era. Together, they made possible the design of relatively small solid-fuel missiles capable of carrying nuclear warheads over intercontinental distances – and thus established the feasibility of the submarine-launched ballistic missile (SLBM). Accordingly, the Navy’s Special Projects Office was established in November 1955 and, under RADM William F. Raborn, moved rapidly to develop the Polaris SLBM and a class of nuclear-powered ballistic missile submarines to carry it. Only five years later, just as Halibut was joining the Pacific Fleet in November 1960, the first of the new class, USS George Washington (SSBN-598), departed on her maiden Polaris patrol in the Atlantic.

In one stroke, the SSBN/Polaris combination eliminated all the disadvantages of the Regulus system: surface launch, liquid fuel, dependence on active tracking and guidance, limited range, small hangar capacity, and a host of other drawbacks. With submerged launch, virtually unlimited endurance, and near invulnerability, the new strategic deterrent quickly supplanted Regulus and the SSG/SSGN. It was not until December 1964, however, that USS Daniel Boone (SSBN-629) conducted the first Polaris patrol in the Pacific, departing Guam that month. Thus, Regulus deterrence was maintained in the western Pacific until May, 1964, when Halibut conducted the final patrol of the series. By that time, the five Regulus boats had conducted a total of 40 WESTPAC deterrent patrols since October 1959 – and in so doing had pioneered one of the central strategic paradigms of the Cold War. Two generations of SSBNs followed.

The submarines... Where are they now? Of the two former fleet boats, Barbero was the first to be decommissioned and stricken from the Navy list in June 1964. Tunny reverted back to SS-282 in May 1965, but her large Regulus hangar made possible her conversion to a troop-carrying submarine, newly designated APSS-282, in October 1966. In this role during 1967, she participated in a number of special operations off the coast of Vietnam. Subsequently, Tunny was decommissioned for the final time in June 1969 and sunk as a target just a year later.

Similarly, with her Regulus installation removed, Grayback served as an amphibious transport (LPSS-574) from May 1969 to mid-1980. The ship was later stricken from the Navy list in January 1984 and sunk as a missile target in 1986. With her missile handling and guidance equipment removed, Halibut was converted to a test platform circa 1965 and used ostensibly in developing the Deep Submergence Rescue Vehicle (DSRV) – but actually for more highly-classified projects – until she was decommissioned in June 1976.

The happiest fate was reserved for Growler, which was decommissioned and placed in reserve in May 1964. Stricken from the Navy list in August 1980, Growler is now preserved in virtually original condition as part of the USS Intrepid Sea-Air-Space Museum in New York City, along with an example of the Regulus I missile. David K. Stumpf's Regulus – the Forgotten Weapon (Turner Publishing, 1996) provides an authoritative and detailed account of the entire Regulus program and its associated platforms.

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Pre-flight Check. A Regulus I is being pre-flighted on its launcher for a land-based test by Guided Missile Group TWO personnel – one of the two JATO units is clearly visible at the rear.

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