

SUB TALES – STORIES THAT SELDOM SURFACE

- by Charles Hood & Frank Hood

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SECOND EDITION



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BOOK PREVIEW

Excerpt from “Emergency Blow!” in Sub Tales

Gravity is something that we terrestrials all take for granted. When we walk, the ground remains level below us. Unless there’s an earthquake, we don’t have to worry about our plates falling out of the china cabinet or our books spilling from our library shelves. In nautical terms, we exist in perfect “trim”, meaning the relationship between our bodies and our environment is predictably steady.

In a submarine, such land rules need not apply. While small changes in depth can be accomplished without significantly tilting the bow either up or down, when a submarine needs to alter its present depth quickly, a so-called up or down angle controlled by the diving planes must be initiated to get from point A to point B. Such changes in the environment where the crew is working, eating or sleeping can provoke significant degrees of disequilibrium. Just imagine how you’d feel if suddenly someone turned the right side of your house up 45° while you were sitting down watching TV.

The change in angle from bow to stern is called the pitch. The same terminology applies to the aerodynamic qualities of aircraft. Similarly, for both ships and aircraft, a change in angle from the perpendicular side-to-side axis is called a roll. Submarines are particularly vulnerable to rolling near or at the surface because of their cylindrical shape and lack of significant ballast. These factors place a boat’s center of gravity above its center of buoyancy. Just talk to any veteran submariner who has been within 200 feet of the ocean surface during a raging storm.

For the purposes of this chapter, we’ll ignore the significant effects of roll and return to the consequences of a sudden change in pitch. Sometimes such drastic measures are necessary in the undersea world. For example, an emergency at an operating depth of 500 feet typically prompts a series of steps to quickly return the submarine to the relative safety of the ocean surface. Possible triggers include fire and flooding. When the situation demands an immediate ascent from operating depth, submarines initiate an emergency run to the surface, more commonly known as an “emergency blow”.

During an emergency blow, high-pressure air is blasted (“blown”) into the main ballast tanks (MBTs), rapidly displacing the water content through the bottom grates on each side. The exchange of water for air in these massive tanks reverses the buoyancy equation immediately; the boat goes from a state of negative or neutral buoyancy to positive buoyancy, and it is the buoyant force that propels the boat back to the surface. At the same time, an “up” angle on the diving planes creates the trajectory that lifts the bow at a considerable angle as the submarine commences a rapid ascent to the ocean surface.

With this introductory background information in mind, let’s travel back to the spring of 1952 off the coast of Oahu, where the USS Pickrel (SS-524) was conducting routine training drills. This Tench-class submarine was commissioned in 1949 and completed as a GUPPY II snorkel boat. She measured 307 feet in length and carried a crew of approximately 75 men. She had gained some publicity in the recent past by breaking the record for continuous miles submerged (5,200) on a 21-day voyage from Hong Kong to Pearl Harbor in the spring of 1950.

The crew of the Pickerel was assigned a special mission for 01 March 1952. She was to attempt to break the record for the steepest angle ever achieved during an emergency blow. Of course, in her case, there was no true emergency, but the Navy was interested to see if she could break the existing record of 43° set by the USS Amberjack (SS-522) in 1950. The CO of the Pickerel, H.B. Sweitzer, accepted the challenge with a certain sense of glee. Sweitzer, a native of Pittsburgh, Pennsylvania, entertained no doubts that he was going to set the new record, and he made certain to inform the crew members of his utter confidence that his boat would eclipse the old mark.

Before the attempt was made, Sweitzer made sure that the battery cells of the Pickerel were topped off and connected in series for maximum power. A Navy helicopter circled overhead to keep an eye on the proceedings, while a companion submarine, the USS Sabalo (SS-522), remained nearby on the surface. The sonarmen of the Sabalo kept close tabs on the whereabouts of the Pickerel once she submerged. Using relative bearing calculations, the photographers assembled topside on the Sabalo to record the attempt were thus informed precisely where to point their cameras as the emergency blow was executed.

Sweitzer ordered the Pickerel to a depth of 250 feet. Officially, the test run was reported to the press as beginning at 150 feet, but Sweitzer wanted a little more “real estate” for acceleration to maximize his boat’s chances of breaking the record. All eyes were on the ocean surface as the Pickerel accelerated first to flank speed (16 knots) and then began her mighty thrust upward.

Most submariners remember their emergency blow drills fondly. These were instituted quarterly as part of the SUBSAFE program in the mid-1960s. Before that time, the drills occurred only at the discretion of the skipper. While the loss of normal trim and the adoption of a fairly steep angle may be disconcerting or even dangerous when not anticipated, in the instance of an emergency blow drill everyone is on the same page and ready for the thrill ride to the top. Many have likened the experience to a ride on a high-speed elevator or a roller coaster; the sensation of moving rapidly at an angle is accompanied by the deafening sound of the MBTs filling with compressed air. (Interestingly, the boat’s propulsion system contributes little to the lifting force, which is nearly entirely a result of the rapid change in buoyancy and the up-angle placed upon the diving planes.)

As the Pickerel began its shot upward to the ocean surface, Sweitzer ordered the up-angle to 60°. He wasn’t interested in merely exceeding the existing record of 43°; he wanted to smash that mark. A clinometer in the Control Room measured the angle from true horizontal. This simple bubble-type indicator, similar in design to a carpenter’s level, was closely monitored on a panel at the ship’s control panel or diving station. The men braced themselves firmly as the boat continued its steep forward tilt. Those men not on watch but in their racks (beds) steadied themselves by gripping the railings. All but three of the racks were intentionally mounted with their long axes parallel to that of the boat, in order to minimize the problem of “dumping” sailors in their berthing areas in the event of a sudden up- or down-angle.

At some point in her historic rise to the surface, the line between Pickerel legend and truth became blurred. There is no question that when she abruptly broke the plane of the ocean surface, she leaped magnificently from the water at a very high angle. Approximately the entire

forward half of the football-field-length submarine cleared the water; photographs show the bow protruding as far aft as the bridge fairwater. A massive splash ensued as the boat leveled out quickly.

Newspapers around the world ran with the same stunning photograph of the breaching submarine at its zenith. The captions varied somewhat, but in general, they described an angle of 48°. Presumably this was the number provided by the Navy press office. However, it is not difficult to measure the precise angle with a simple protractor from the famous photograph. This informal analysis yields an angle of 53°. Either of these measurements would confirm that the Pickerel eclipsed the old record with ease.

Excerpt from “The USS Corporal: First Submarine To Reel in a Helicopter!” in Sub Tales

On Thursday, 26 April 1956, off the southern coast of Florida about 20 miles from Key West, LCDR William F. “Frank” Culley of Augusta, Georgia noticed a problem mid-flight. Culley, the pilot of Navy helicopter #51 on an anti-submarine warfare (ASW) training run as part of Squadron VX-1, realized that he was losing oil quickly from the main rotor assembly. He was too far from the coast to return for an emergency landing. Culley’s mind raced as he considered his options. An experienced pilot with more than 20 years of service in the Navy, Culley was assigned as a personnel officer to the Naval Air Training Center in Pensacola, FL.

Bailing was certainly possible, giving Culley and fellow crew members the best opportunity to survive the incident, although at the cost of a very expensive Navy helicopter—the Sikorsky HSS-1, known as the Seabat because of its ASW package. Finding a small cay in the vicinity to land on would be ideal, but a sweep of the ocean landscape failed to show any small landmasses that might have provided such an opportunity. Crashing into the ocean was not a desirable option. Culley, his co-pilot Lieutenant J. K. Johnson, and the two other men on board, G.A. DeChamp (SO3—Special Warfare Officer) and M.R. Dronz (AT2—Aviation Electronics Technician), realized that they had precious few minutes to decide before mechanical failure required a costly abandonment. A “mayday” call was sent from the helicopter in hopes that another Navy or even merchant vessel could lend a hand.

Meanwhile, not far from the distressed helicopter, the USS Corporal (SS-346), assigned to the submarine base at Key West, was submerged while participating in the ASW exercises as a designated opposing boat. The Corporal was a Balao-class submarine. She was built at the Electric Boat shipyard in Groton, Connecticut and commissioned shortly after the conclusion of World War II in November 1945. She carried a complement of 10 officers and about 70 enlisted men. The Corporal was 312 feet in length with a beam of 27 feet, 3 inches. As it turned out, she would need every inch of that beam for her next unscheduled assignment.

The radio shack of the Corporal intercepted the mayday call from the disabled helicopter. This news was communicated immediately to the sub’s skipper, LCDR Erman O. Proctor. Already in the Control Room at the time of the transmission, Proctor wasted little time: “Emergency surface. Blow all main ballast.” The words reverberated over the sub’s 1MC as the Corporal executed an emergency blow and came to the surface with a gargantuan splash. In contact with the helicopter, Proctor ascertained that the Seabat could remain airborne for only a short time

longer. Culley requested the Corporal to make heavy knots in his direction to pick up survivors should the need to ditch the helicopter arise.

The Corporal radioed that they were on their way to the scene directly and then proceeded at flank speed to the provided coordinates of the bird. In just a few minutes, the Corporal made its first visual contact of the disabled helicopter, hovering only a short distance above the ocean surface. Moving closer to the helicopter's position, Proctor was struck by a radical idea that he shared with Culley. "How about attempting an on-deck landing?" The reply from the helicopter was emphatic: "Hell yes, let's give it a go!" No one wanted to see a valuable asset plunge needlessly to the ocean depths; the replacement cost for the Sikorsky helicopter was about \$250,000.

The Corporal carefully positioned itself directly under the still-hovering helicopter. Communications between helicopter and submarine continued at a fast and furious pace. The mechanical issue with the helicopter prevented it from turning in any direction; hovering was still possible, but no adjustment in heading could be made from the cockpit. Once the Corporal understood this limitation, she maneuvered herself in the open seas such that her afterdeck was lined up with the landing wheels of the helicopter.

At that moment, there were two critical issues to ponder. First, was the beam of the submarine wide enough to accommodate the landing wheels of the helicopter? The answer to that question wasn't immediately clear to those crew members of the Corporal who had gone topside to inspect the underside of the hovering bird; the impromptu "recovery party" consisted of volunteers headed up by the Chief of the Boat (COB). Second, assuming that there was enough room from side to side, could the pilot of the helicopter bring her down in the very tight window from fore to aft on the submarine deck without striking the sail with its main rotor or the fantail with its rear rotor?

Since no one had ever seriously contemplated the answers to those questions, all the men could do was to look closely and guess. Their observations suggested that although landing was a very tight proposition, there seemed to be just enough room from fore to aft and from port to starboard along the after deck to give it a shot. The synchrony between helicopter and submarine would have to be near perfect to pull off the feat.

Given the vagaries of the sea and the ever-shifting wind conditions, which could shift the relative positions between the two assets in a split-second, the whole idea seemed very risky. However, short of dumping the helicopter into the drink, there seemed to be no other viable alternatives, so the submarine crew prepared for their surprise "drop-in".

The COB and his topside volunteers had no protocol manual to draw from. They simply relied on their instincts to mitigate the risks of the impending landing—such as taking down the long wire antenna to avoid an inadvertent snag. The men then grabbed mooring lines in preparation for the next step. The helicopter began its final descent as pilot Culley attempted to keep his bird directly over the centerline of the submarine hull. Except for one intrepid sailor, the members of the recovery party stayed crouched at a safe distance just forward of the sail during this time.

The person who volunteered to stand in harm's way was engineering officer LTJG George Ellis, who braced himself along the after edge of the sail and provided hand signals for the pilot to fine-tune his landing. Ellis' role was critical simply because the margin for error was razor-thin. He risked serious injury or even death from any errant move during his makeshift role as a signal officer. The main rotor blades of the descending helicopter spun very close to his head.

The Radio Shack of the submarine sent the message, "Do you think you will make it?" Any response from the helicopter was delayed since the message was received just as the three wheels of the bird (two front, one rear) made firm contact with the after deck. The landing had to be perfect; fortunately, the seas were very calm during the attempt. With the precise teamwork between the hand signals of LTJG Ellis and the considerable skill of the helicopter pilot, the bird touched down. Incredibly, a small part of each front wheel ended up overhanging the deck edge on each side, but there was just enough room for enough of the rubber on the wheels to grip the deck and remain stable. The landing had been dead-center; a couple of inches off on either side could have spelled trouble for the Seabat.

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