

## DEPTH

Regardless of age and use the depth capabilities of US Submarines is classified. Throughout this collection of See Stories, I refer to five different depths (actually six, but we don't talk about one of them), that were common and well known to the crew. I will describe here what those six different levels were.

**SURFACE** – This is the obvious starting point, the boat when surfaced was exposed, in the case of the 563 class this exposure not counting the height of the sail was 10 feet. With a Beam of 27 feet is it easily understood that 17 feet was under the water when surfaced. That's approximately the height of a two-story building. The 637 class submarine things were a little different, only about 5 or 6 feet was exposed of the nearly 32-foot beam, again not counting the height of the sail.

**PERISCOPE DEPTH** – The next true "depth" was periscope depth, and it's adjustable. The entire submarine was indeed submerged at this point except the "Attack" Periscope would be one extreme, followed by the "#2" Periscope which would be slightly shallower than the "Attack" scope because it also allowed for visibility of the other "masts" that could be raised or lowered. Finally the ultimate variable was the Officer of the Deck (OD). He would command a specific depth such that the Periscope he was using at the time would be at varying heights above the water for the purpose of visual range. The visual horizon for an average person of 5 and a half feet standing on a beach is approximately a little over 3 miles (which was the standard establishing "territorial waters"), IF there were no waves. Flipping that around to a "periscope view" that depends on what you are looking for, as it has a height. Now then on a 563-class boat you had to think about the wave height as they would be influenced by the up and down of passing waves. On a 637 class it was pretty much "at depth" unless there were Beaufort scale 5 seas or above. So back to the Periscope "depth" and the OD. He would adjust his viewing height depending on wave height and desired visual range. Considering the respect for the convention of International waters of 12 miles from the coast. Well you can do the math.

**SONAR SWEEP** – Now then not all submarines, but on many of them the CO would request that his OD's proceed to a depth just below Periscope Depth prior to going up to Periscope depth. When steady at that depth, Sonar would be requested to "Perform a Careful Sweep around". This was because of thermal layers in the ocean. Under certain conditions, a large difference in water temperature (or salinity) could cause a ducting of the propagating sound waves coming from a contact of interest.

**CRUISE DEPTH** – The bulk of your time is going to be at Cruise Depth, again a level determined by the Commanding Officer in consultations with the Navigator and the mission orders, wherever that was. This depth was no where near Sonar or Periscope depth, and as a point of reference it was typically below the major thermal layers. It was also determined by what we all knew as the 100-fathom curve. When entering or leaving port the 100-fathom curve was a standard depth that you either started your ascent to the surface if entering port, or you

remained surfaced until you were outside that earthly perimeter to land masses. And BTW the 100-fathom curve did not follow the international waters boundary – that was a detail also paid attention to by the navigator and his briefing of the CO and in turn the OD.

**TEST DEPTH** – In all my time at sea on submarines, I only went to Test Depth on 8 occasions. All eight were normal “quarterly” required drills. Test Depth was a depth specified by the manufacturer. In other words think of it as the depth at which the warranty would run out. If you exceeded Test Depth any damage done would be on your own dime. And finally you should know that Test Depth had a considerable margin from the final depth; which is Crush Depth.

**CRUSH DEPTH** – I never went to Crush depth, but I know of some that ventured partway and made it back. There are others that didn’t make it. Scorpion and Thresher were two that exceeded Crush Depth. And they put me on a cautionary line of thinking, when I rode Puffer, Pintado and Pogy. There was this thing called the STP Theory. That theory was that starting with **S** for Scorpion, and **T** for Thresher, the next boat to exceed crush depth would begin with the letter **P**.