

= HMS Swordfish (1916) =

HMS Swordfish was an experimental submarine built for the Royal Navy before the First World War to meet the Navy 's goal of an " overseas " submarine capable of 20 knots (37 km / h ; 23 mph) on the surface . Diesel engines of the period were unreliable and not very powerful so steam turbines were proposed instead to meet the RN 's requirement . Swordfish proved to be slower than designed and unstable while surfacing , and consequently she was modified as an anti @-@ submarine patrol vessel in 1917 . She was paid off before the end of the war and sold for scrapping in 1922 .

= = Design = =

HMS Swordfish was developed to meet a requirement of Royal Navy 's Submarine Committee for a large submarine capable of operating with the fleet at a surfaced speed of 20 knots . Most of the earlier British submarines had been single @-@ hulled vessels built by Vickers , and the Navy was interested in evaluating other designs . Captain Roger Keyes , Inspecting Captain of Submarines , had previously served as naval attaché in Italy and had kept abreast of Italian submarine developments , which notably included double @-@ hulled submarines designed by Cesare Laurenti of Fiat @-@ San Giorgio . Three boats of the S class were ordered first and Laurenti was invited to submit a design to meet the RN requirement .

Fiat @-@ San Giorgio " was wary about using heavy oil Diesel engines and hesitated to guarantee the success of such engines of the power required . At the same time Laurenti prepared a design with geared steam turbines having a speed of 18 knots on a surface displacement of 856 tons . " His design was modified by Scotts Shipbuilding and Engineering Company , Greenock , to include guns . Swordfish kept the same main dimensions as Laurenti 's original design , but had a greater displacement and less endurance .

= = Description = =

Swordfish had an overall length of 231 ft 3 @.@ 5 in (70 @.@ 498 m) , a beam of 22 ft 11 in (6 @.@ 99 m) , and a draught of 14 feet 11 inches (4 @.@ 55 m) . She displaced 932 long tons (947 t) on the surface and 1 @,@ 105 long tons (1 @,@ 123 t) submerged . She had a partial double hull , which extended over 75 % of her length . The upper portion of the double hull was controlled free @-@ flooding while the rest was devoted to watertight ' baling flats ' , ballast and fuel tanks . Her hull was divided into eight compartments by seven watertight bulkheads .

Swordfish 's diving depth and time are not known because the records from her sea trials have not survived . Shutting down her boiler , retracting the funnel and sealing the boiler uptake required about a minute and a quarter , which included switching over to the electric motors . In marked contrast to contemporary Vickers designs much attention was paid to safety arrangements , including her extensive subdivision . Indicator and telephone buoys , which could be released from inside the submarine were provided together with external air connections and a charged high @-@ pressure line which could provide air to any manned compartment or the living spaces . Furthermore , the main ballast tanks could be blown from either end of the ship .

= = = Propulsion = = =

Swordfish had two Parsons geared impulse @-@ reaction steam turbine sets , each driving one of the two propeller shafts . The turbines were powered by a single Yarrow @-@ type boiler . They were designed to produce a total of 4 @,@ 000 shaft horsepower (3 @,@ 000 kW) at a working pressure of 250 psi (1 @,@ 700 kPa ; 18 kgf / cm²) which used a superheater to increase the working temperature by 100 ° F (38 ° C) . She was fitted with two electric motors which had a combined output of 1 @,@ 400 bhp (1 @,@ 000 kW) . Two battery rooms each had 64 battery cells . It is uncertain if the ship reached her designed speed of 18 knots on the surface , although it

seems unlikely given her increased displacement over Laurenti 's original design . Maximum speed was 10 knots (19 km / h ; 12 mph) underwater .

Swordfish could carry 102 long tons (104 t) of fuel oil , which her builders estimated gave her an endurance of 3 @, @ 000 nautical miles (5 @, @ 600 km ; 3 @, @ 500 mi) at a speed of 8 @. @ 5 knots (15 @. @ 7 km / h ; 9 @. @ 8 mph) on the surface . On her batteries her submerged endurance was 60 nautical miles (110 km ; 69 mi) at a speed of 6 knots (11 km / h ; 6 @. @ 9 mph) .

= = = Armament = = =

Swordfish had two tubes for 21 @-@ inch (530 mm) torpedoes in her bow . They were stepped vertically and positioned well back from the stem in a notch from the keel to preserve the fine lines of the bow . Two 18 @-@ inch (460 mm) torpedo tubes were positioned on each beam amidships . Each torpedo tube was provided with one reload . Two 3 @-@ inch (76 mm) guns were fitted on the deck in disappearing mounts , one each fore and aft of the conning tower . They were covered by watertight hoods to preserve the streamlining of the submarine .

= = Construction and service = =

Swordfish was ordered from Scotts Shipbuilding and Engineering Company on 18 August 1913 although she was not laid down until 28 February 1914 . The start of the First World War six months later greatly hindered her completion , and she was not launched until 18 March 1916 . HMS Swordfish was commissioned on 28 April 1916 , before completion , and renamed HMS S1 that same day . She was not completed until 21 July .

Captained by Commander Geoffrey Layton , her post @-@ completion trials lasted for five months as she was used to evaluate steam power for submarine use . Much was learned about the operation of steam submarines , which helped the subsequent design of the steam @-@ powered K @-@ class fleet submarines . She proved to be very unstable while surfacing , presumably because she could not pump the water out of her controlled free @-@ flooding spaces quickly enough in the upper part of her double hull . These problems , coupled with the fact that she was too slow to work with the fleet as originally envisioned , meant that she was impossible to make into an effective warship , and she was laid up after her trials .

In July 1917 S1 reverted to her original name and was converted to a surface patrol vessel between 27 June 1917 and 24 January 1918 . Her torpedo tubes and disappearing guns were removed . She was given a forecastle , a bridge and her funnel was fixed in place and extended . She was rearmed with a pair of 12 @-@ pounder (3 inch , 76 mm) guns and depth charges , weapons more suitable for her new role as an anti @-@ submarine patrol boat . Swordfish joined the 1st Destroyer Flotilla at Portsmouth upon completion of her sea trials , but nothing is known of her subsequent service .

Swordfish was paid off on 30 October 1918 and stricken from the Navy List by January 1919 . She was sold for scrapping to Pounds , of Portsmouth in July 1922 , but was reported to have been resold to Hayes , of Porthcawl in 1923 .