= Normandie @-@ class battleship =

The Normandie class of dreadnought battleships was a group of five ships ordered for the French Navy in 1912 ? 1913 . The class comprised Normandie , the lead ship , Flandre , Gascogne , Languedoc , and Béarn . The design incorporated a radical arrangement for the twelve 340 mm main battery guns : three quadruple gun turrets , as opposed to the twin turrets used by most other navies . The first four ships were also equipped with an unusual hybrid propulsion system that used both steam turbine and triple expansion engines to increase fuel efficiency .

The ships , named after provinces of France , were never completed due to shifting production requirements after the outbreak of war in 1914 . The first four ships were sufficiently advanced in construction to permit their launching to clear the shipyards for other , more important work . Many of the guns built for the ships were instead converted for use by the Army . After the war , the French Navy considered several proposals to complete the ships , either as originally designed or modernized to account for lessons from the war . The weak French post @-@ war economy , however , necessitated that the first four ships be broken up for scrap . The last ship , which was not significantly advanced at the time work halted , was converted into an aircraft carrier in the 1920s . She remained in service in various capacities until the 1960s . The ship was ultimately scrapped in 1967 .

= = Development = =

In December 1911 , the French Navy 's Technical Committee issued a report that examined the design of the Bretagne class that had been ordered for 1912 . They concluded that the amidships gun turret was an unsatisfactory choice , based on previous experiences with blast damage on battleships from the 1880s . This position influenced the construction of the next class of dreadnought battleships , for which design work began shortly thereafter . The French Navy 's design staff submitted the first draft of the new dreadnought design in February 1912 . The size of French shipyard facilities significantly impacted the design . Length was limited to 172 meters (564 ft) , breadth to 27 @.@ 8 m (91 ft 2 in) , and draft to approximately 8 @.@ 8 m (29 ft) . These dimensions limited the ship to a displacement of around 25 @,@ 000 metric tons (25 @,@ 000 long tons) and a speed of 20 to 21 knots (37 to 39 km / h ; 23 to 24 mph) , depending on the armament arrangement . The design staff advocated retaining the same armament and armor as the previous Bretagne class , and a top speed of 21 knots .

The design staff prepared another version that was armed with a main battery of sixteen 406 mm (16 @.@ 0 in) guns in four quadruple turrets and had a top speed of 20 knots . The Technical department prepared two different designs for the propulsion system . Four direct drive steam turbines were proposed , as in the Bretagne class ; the other option was a hybrid system that used a pair of direct drive turbines on the inner two propeller shafts , and two reciprocating steam engines on the outer shafts for low @-@ speed cruising . The latter design was adopted for the new ships , as the all @-@ turbine system was less fuel @-@ efficient . The fifth ship , Béarn , however , was instead equipped with four sets of turbines . The armor layout of the Bretagne class was retained , and the full load draft fixed at no greater than 9 m (30 ft) .

The next issue to be addressed was the main armament . The General Staff decided in March 1912 to retain the 34 @-@ centimeter (13 in) gun of the Bretagne class . They chose the new quadruple turret and advocated an armament of twelve guns in two quadruple and two double turrets . If this arrangement placed too much weight on the bow and stern , the arrangement of five twin turrets as in the Bretagne @-@ class battleships would be substituted . In April 1912 , the Naval Supreme Council accepted the latter design , unless the quadruple turret could be readied by the time construction was scheduled to begin . The armor layout of the Bretagne class was to be retained , though an increase in the thickness of the main belt was to be effected if possible .

The Technical Department prepared two new designs , A7 , which incorporated the five twin turrets , and A7bis , which was armed with three quadruple turrets . The A7bis design was some 500 t (490 long tons ; 550 short tons) lighter than the A7 design , and on 6 April , the Navy accepted a

quadruple turret design submitted by Saint @-@ Chamond . The secondary battery was initially to have comprised twenty @-@ two 138 @.@ 6 mm (5 @.@ 46 in) guns , but by subtracting four guns , twelve 100 mm (3 @.@ 9 in) guns could be added for the same weight . The 100 mm design was not completed by the time work was scheduled to begin , so the 138 @.@ 6 mm gun was chosen . The Technical Department had initially proposed mounting the secondary guns in single and twin turrets , but it was determined that this arrangement was not flexible enough . Instead , they were mounted in casemates in eight groups of three guns .

= = = Characteristics and machinery = = =

The ships were 170 @.@ 6 m (559 ft 9 in) long between perpendiculars , 175 @.@ 6 m (576 ft 1 in) long at the waterline , and 176 @.@ 6 m (579 ft 5 in) long overall . They had a beam of 27 m (88 ft 7 in) and a draft of 8 @.@ 65 m (28 ft 5 in) . At full load , the ships were to displace 25 @,@ 230 t (24 @,@ 830 long tons) . The first four ships were equipped with a pair of steam turbines on the center shafts , without reversing gear . Normandie and Flandre had Parsons turbines , Gascogne had turbines built by Rateau @-@ Bretagne , and Languedoc 's turbines were built by Schneider @-@ Zoelly . The four ships had a pair of four @-@ cylinder triple expansion engines for steaming astern or cruising at low speed . The last ship , Béarn , was equipped with four Parsons turbines . Normandie and Gascogne were given twenty @-@ one Guyot du Temple small tube boilers , Flandre and Languedoc were equipped with twenty @-@ eight Belleville small tube boilers , while Béarn had twenty @-@ one Niclausse small tube boilers .

The ships ' engines were rated at 32 @,@ 000 shaft horsepower (24 @,@ 000 kW) and had a top speed of 21 knots (39 km / h ; 24 mph) , with plans to increase the power to 45 @,@ 000 shp (34 @,@ 000 kW) and 22 knots (41 km / h ; 25 mph) . The ships were designed to carry 900 t (890 long tons) of coal and 300 t (300 long tons) of fuel oil , but up to 2 @,@ 700 t (2 @,@ 700 long tons) of coal could be stored in the hull . At a cruising speed of 12 knots (22 km / h ; 14 mph) , the ships could steam for 6 @,@ 500 nautical miles (12 @,@ 000 km ; 7 @,@ 500 mi) ; at 16 knots (30 km / h ; 18 mph) , the range fell to 3 @,@ 375 nmi (6 @,@ 250 km ; 3 @,@ 884 mi) , and at top speed , the cruising radius dropped to 1 @,@ 800 nmi (3 @,@ 300 km ; 2 @,@ 100 mi) . The ships would have had a crew of 43 officers , 120 petty officers , and 1 @,@ 037 enlisted men .

= = = Armament and armor = = =

Twelve 340mm / 45 Modèle 1912 guns mounted in three quadruple turrets comprised the main battery . One turret was placed forward , one amidships , and one aft , all on the centerline . The turrets weighed 1 @,@ 500 t (1 @,@ 500 long tons ; 1 @,@ 700 short tons) , and were electrically trained and hydraulically elevated . The guns were divided into pairs and mounted in twin cradles ; a 40 mm (1 @.@ 6 in) thick bulkhead divided the turrets . Each pair of guns had its own ammunition hoist and magazine . They could be fired simultaneously or independently . The guns had a range of 16 @,@ 000 m (52 @,@ 000 ft) and had a rate of fire of two rounds per minute . The shells were 540 @-@ kilogram (1 @,@ 190 lb) armor @-@ piercing rounds and were fired with a muzzle velocity of 800 meters per second (2 @,@ 600 ft / s) . Each gun was to have been supplied with 100 rounds of ammunition . Five 3 @.@ 66 m (12 @.@ 0 ft) rangefinders provided fire @-@ control for the main battery . Two of the rangefinders were mounted on the conning tower and the other three were placed atop each of the turrets . The turrets also had secondary gunnery control stations .

The ships would also have been armed with a secondary battery of twenty @-@ four 138 @.@ 6 mm / 55 Modèle 1910 guns , each singly mounted in casemates in the hull . These guns fired a 36 @.@ 5 kg (80 lb) shell at a muzzle velocity of 830 m / s (2 @,@ 700 ft / s) . The guns would have been supplied with 275 rounds of ammunition each . Six 47 mm (1 @.@ 9 in) M1902 anti @-@ aircraft guns , which were converted from low @-@ angle guns , would also have been carried by the ships . The ships were also equipped with six 450 mm (17 @.@ 7 in) torpedo tubes , mounted submerged in the hull . Each ship was to be supplied with 36 torpedoes .

The ships ' waterline belt armor was 300 mm (12 in) thick amidships , and reduced to 120 to 180 mm (4 @.@ 7 to 7 @.@ 1 in) at the bow and stern . The upper belt was 240 mm (9 @.@ 4 in) thick amidships and 160 mm (6 @.@ 3 in) on the ends . The ships had two armored decks , both 50 mm (2 @.@ 0 in) thick . Sloped armor 70 mm (2 @.@ 8 in) thick connected the lower deck to the side armor . The conning tower had 300 mm thick sides . Each of the barbettes that supported the main battery turrets were protected with 284 mm (11 @.@ 2 in) of armor ; the turrets had 340 mm (13 in) thick faces and 250 mm (9 @.@ 8 in) thick sides . The casemate guns were protected by 160 ? 180 mm thick armor plating .

= = Ships = =

= = Construction and cancellation = =

Normandie and Languedoc were ordered on 12 December 1912 , followed by Flandre and Gascogne on 30 July 1913 . Béarn was ordered on 3 December ; the five ships would permit the creation of two four @-@ ship divisions with the three Bretagne @-@ class ships then under construction . Work on the class was suspended at the outbreak of World War I , as all resources were needed for the Army . The government did not immediately mobilize for war , as they expected the conflict to be brief . The first four ships were launched after the start of the war , but only to clear the slipways for other purposes . In July 1915 , the Navy determined that the ships were not a priority , and prohibited further work . Later in July , work on the ships ' armament was suspended , save the guns themselves , which could be converted for use by the Army . Four of the completed 340 mm guns were converted into railway guns for the French Army . Nine of the guns built for Languedoc were also mounted on railway carriages in 1919 , after the end of the war . Several of the 138 @.@ 6 mm guns were also converted for service with the Army .

At the time work stopped , Normandie 's hull was 65 percent complete , her engines were 70 percent complete , and her boilers were delivered but were instead installed in new destroyers . The turrets were 40 percent assembled . Languedoc had 49 percent of her hull and 73 percent of her engines constructed ; her boilers were 96 percent complete and only 26 percent of her turrets were built . The hulls of Flandre and Gascogne were 65 and 60 percent complete , respectively , and their engines were 60 and 44 percent assembled . Both of their sets of boilers were used for destroyers . The two ships ' turrets were 51 and 75 percent complete . Work on Béarn had not significantly progressed by the time war broke out : her hull was only 8 ? 10 percent complete and her engines were only 25 percent finished . Her boilers were 17 percent assembled , and her turrets were at 20 percent .

In January 1918 , a final wartime order specified that the ships remained suspended , but that all material that had been stockpiled for work would remain in place . By that time , some 3 @,@ 086 t (3 @,@ 037 long tons ; 3 @,@ 402 short tons) of steel plating that had been earmarked for Gascogne had been taken for other uses . On November 22 , 1918 , days after the Armistice with Germany , the design staff sent the General Staff a proposal to complete the first four Normandies to a modified design . The General Staff replied that the ships would need a top speed of 26 to 28 kn (48 to 52 km / h ; 30 to 32 mph) and a more powerful main battery . Since the dockyard facilities had not been enlarged during the war , the size of the ships could not be significantly increased . This allowed for only modest improvements , particularly for the installation of anti @-@ torpedo bulges . In February 1919 , the General Staff decided that the ships would be completed anyway , because new vessels incorporating the lessons of the war could not be completed for at least 6 to 7 years , due to the lengthy design studies such battleships would require .

The Technical Department created a revised design that incorporated some improvements . The machinery for the four ships that had been launched during the war would be retained ; increasing their speed to 24 kn (44 km / h ; 28 mph) required a corresponding increase to 80 @,@ 000 shp (60 @,@ 000 kW) , which could be obtained by building new turbines . The elevation of the main guns was to be increased to 23 ? 24 degrees , which would increase the range of the guns to 25

@,@ 000 m (82 @,@ 000 ft) . The need to engage targets at longer ranges was confirmed by the examination of one of the ex @-@ Austrian Tegetthoff @-@ class ships that had been surrendered to France at the end of the war . The main armored deck was to be increased to 120 mm (4 @.@ 7 in) to increase resistance to plunging fire . The submerged 450 mm torpedo tubes were to be replaced with deck @-@ mounted 550 mm (22 in) tubes , and fire control equipment was to be improved . Equipment for handling a two @-@ seat spotter aircraft was also to be installed .

After the war , Admiral Pierre Ronarc 'h became Chief of the General Staff , and in July 1919 he argued that the Italian Navy was the country 's primary rival , and that they might resume work on the Francesco Caracciolo @-@ class battleships that had been suspended during the war . He suggested there were three options for the first four ships : complete them as designed , increase the range of their guns and improve their armor , or lengthen their hull and install new engines to increase speed . The Technical Department determined that lengthening the hulls by 15 m (49 ft) could increase speed by as much as 5 kn (9 @.@ 3 km / h ; 5 @.@ 8 mph) . Nevertheless , by 12 September 1919 , he had determined that completing the ships would be too expensive for the fragile French economy . Plans for the four incomplete ships included converting them into cargo ships , fuel tankers , or passenger liners , and using them as floating fuel depots . These plans were abandoned , however . The four ships were formally cancelled in the 1922 construction program , and were laid up in Landevennec and cannibalized for parts before being broken up in 1923 ? 1926 . Much of the salvaged material was incorporated into completing Béarn and in the cruisers built during the 1922 program .

Béarn was launched in April 1920 to clear the slip ; the Navy had not yet decided what to do with the vessel . Plans to complete the battleship included replacement of the coal @-@ fired boilers with eight oil @-@ fired Niclausse boilers and new , more powerful turbines . A new quadruple turret that allowed for greater range was considered , along with twin turrets mounting 400 mm (16 in) guns . In 1922 , the Navy instead decided to complete the ship as an aircraft carrier . Conversion work began in August 1923 , and was completed by May 1927 . The ship was the first carrier of the French Navy . She served in the fleet through World War II , though she was used as a ferry for aircraft . In 1944 , she was refitted in the United States and equipped with a battery of modern American anti @-@ aircraft guns . She remained in service through the First Indochina War , still as an aircraft ferry . She was ultimately broken up for scrap starting in 1967 .