International Journal of New Developments in Engineering and Society
ISSN 2522-3488 Vol. 4, Issue 3: 179-187, DOI: 10.25236/IJNDES.040316

Sink of the Bismarck

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ABSTRACT: *On the morning of May 27, 1941, after receiving a continuous hammering that no other warship could have taken, the Bismarck finally sank to the bottom of Atlantic. For the German Navy the sinking of the battleship Bismarck was probably the heaviest single blow of the war. It not only marked a turning point in the war on Allied merchant shipping but also reflected the serious lack of understanding of sea power in Nazi Germany. This article explores Bismarck's design concept by analyzing the background of the times. Although the treaty limited her firepower and tonnage, she was still the most formidable warship in the Atlantic during World War II. By restoring Bismarck's short but brilliant life, this paper try to explore complicated factors that contributed to her sinking.*

KEY WORD: *the Bismarck, Operation Rhine Exercise, Battle of the Denmark Strait*

The development of large warships under restriction

Despite its tactical victory in Battle of Jutland, the German Navy could not escape the blockade of the Royal Navy. In 1919, Germany was defeated in the first World War. Britain wiped out the German fleet at one stroke and forced Germany to sign the Treaty of Versailles. It was clearly stipulated in the treaty that the German naval forces in commission could not exceed six battleships, six light cruisers, twelve destroyers and twelve torpedo boats. Only eight old battleships were allowed to be reserved for training and coastal defense. These old battleships were not only poor in firepower, slow in speed and poor in defense, but also some of their weapons were dismantled by Britain and France. The construction of the following ships must be started 20 years after the substituted ships were launched. The maximum displacement shall not exceed 10160 tons and the caliber of main gun shall not exceed 280 mm.1

In the early 1920s, Germany, which endured the humiliation of defeat under the domination of national rejuvenation thought, had a strong desire to build new battleships. As for the restrictions of the treaty, Germany carefully studied and gave

1 BISMARCK'S DESIGN, http://www.kbismarck.com/design.html

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full play to its technical advantages under the treaty restrictions, carefully designed and built three Panzerschiff (later Deutschland Class) which called armored ships by other countries, combined with the tactical needs of the Navy. These new battleships would still be slower than the 10,000-ton heavy cruisers of foreign navies but its firepower, protection and range (due to its diesel engines) would be superior to them. Stronger enemy battleships on the other hand would be slower.

Adolf Hitler Comes to Power.

On 30 January 1933, Adolf Hitler became the new chancellor of Germany. At this time, German naval shipbuilding was still restricted by the Treaty of Versailles, also, Hitler was concerned about the limitations of the Treaty of Versailles. He even told Admiral Raeder, commander of the German Navy, that the role of the German Navy lay within the framework of its responsibilities toward European continental policy, and that he did not want to have war with England, Italy, or Japan. Since the Russian Navy was not well developed, France was the only European power that could become a possible opponent.2

In 1934, France announced the construction of the second Battlecruiser Strasbourg. In December 1933, Hitler gave his approval for a fourth Panzerschiff followed by a fifth soon afterwards. In order to match the French battlecruisers, the new Panzerschiffe were to be considerably larger and more heavily armoured that the previous three units, but they would retain two 28-cm triple turrets.

However, Hitler's ostensible claims ran counter to active armament in confidence. Since he came to power, he intended to break through the treaty restrictions and rearm Germany.

Anglo-German Naval Agreement

On March 16, 1935, Hitler officially announced the unilateral abolition of the Treaty of Versailles and renamed the German navy the Kriegsmarine. However, this did not satisfy Hitler's goal of expanding his power on the Atlantic.

Only three months later, on June 18, 1935, Britain's Foreign Minister Sir Samuel Hoare and the German Ambassador Joachim von Ribbentrop signed the Anglo-German Naval Agreement, allowing Germany to build ships equivalent to 35% of the total tonnage of British naval vessels, and allowed Germany to build 183,000 tons of battleships. With this naval agreement, it was tantamount to basically abolishing all restrictions on the development of German armaments in the Treaty of Versailles. Therefore, Germany seized this opportunity and decided to build a large ocean cruiser.

2 BISMARCK'S DESIGN, http://www.kbismarck.com/design.html

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Meanwhile, Germany designed and built two Scharnhorst class battleships, which continued the Deutschland class ideas and improved. The design and construction of Scharnhorst class battleships marks that the design and construction level of the new-type battleship of Kriegsmarine has begun to mature, laying a solid foundation for the construction of Bismarck class battleship.

Design and Construction of Bismarck

The battleship was named in honor of the "Iron Chancellor", Otto von Bismarck, the architect who masterminded unification of the German empire. Under his leadership, Prussia achieved victory against Denmark, Austria, and France, which made the German Empire dominated the continent of Europe.

Bismarck's construction was by no means a product of the Naval Agreement. In fact, the Naval Construction Office first began to consider the planning of a 35,000-ton ship in early 1934. After the signing of the Naval Agreement, the contact "F" Ersatz Hannover (later the Bismarck), which was placed with the shipbuilding firm Blohm & Voss based in Hamburg, was officially ordered.

In 1936, when the Washington Naval Treaty expired, Britain proposed to renew the London Naval Treaty. France and Italy announced that they would not participate in the treaty. Later, Japan, which had previously agreed, refused to sign the treaty since her demands for parity with the United States and the British Empire in capital ship tonnage were not met. An escalator clause was added that allowed her real displacement would actually reach 41,700 tons.

Armor protection is the most remarkable aspect of the Bismarck. After the first World War, Germany began to develop special structural steel and armor steel. These industrial scientific research achievements have laid a good foundation for the construction of the Bismarck.

The armor protection design of the Bismarck was mainly divided into vertical protection, horizontal protection and underwater protection.3 Vertical protection mainly refers to the design of deck and structure installed vertically. The vertical protection of the Bismarck was mainly aimed at the command tower, turret and other important parts of the superstructure as well as the parts above the waterline of the ship. In fact, the vertical armor of the ship extended below the waterline. In a sense, the vertical protective armor belt of the Bismarck followed the armor protection type of the central armored fort, and a protective ring structure was formed by armor plates in the middle of the ship. The Bismarck had an armored belt that ranged in thickness from 220 to 320 mm. It covers 70 percent of the total length of the water line of the battleship and two deck cabins.4 As a result, all the important parts of the Bismarck were under the protection of armor belt, and only

3 ARMAMENT, http://www.kbismarck.com/armament.html

4 PROTECTION, http://www.kbismarck.com/proteccioni.html

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the bow and stern parts were not armored. Special care was put to the stability, and the ship was given a very wide beam of 36 meters, one of the most outstanding characteristics of the new Bismarck Class was its superb capability to absorb damage due to the large protected volume.

Four armoured twin turrets are alphabetically arranged on the fore deck and the rear deck. The main battery was equipped with armor piercing capped to attack large surface targets, and high explosive grenades are also used for shore attack and air combat. At that time, the 381 mm main gun turret combatant chamber of Germany was much larger than that of British battleships, and the gun barrel spacing was larger. The barrel of dual charge gun could be operated independently without affecting each other. When one barrel was firing, the other barrel might be reloaded. The advantage of those guns was that the high muzzle velocity, with no disturbance between the barrel, which permitted to obtain a very accurate and rapid fire.

For battleships, speed was a very significant indicator. Although with the improvement of weapon precision and shooting range, the speed centered operation has been gradually abandoned by the navies of various countries. The battleship Bismarck had a steam propulsion plant that amounted to only 9% of the ship's weight. Within the ship’s boilers, fuel oil was burned and feed water heated, thus producing steam. This steam reached very high pressure and was then delivered to the turbines that turned the propellers, which gave her an outstanding speed at 30 knots(56km/h). Meanwhile, it was hard for German Navy to get oil supply since Germany had lost most of her overseas colonies after World War I. The Bismarck was designed with excellent endurance which can allow her steam for more than 8000 nautical miles at 19 knots.

Three command posts who directed the main and secondary batteries equipped with FuMO 23 radar and large optical rangefinder.5 This kind of radar can search the water surface in bad weather, but the German radar design did not install the PPI (Plan Position Indicator) display system, only a simple A-scope display instead. It was cumbersome for them to detect multiple targets and tortuous coast. One of the reasons why FuMO 23 radar didn't have PPI display was that senior German Nazi officials thought the device was too complicated and luxurious, which was an important defect in the design of the Bismarck.

On 14 February 1939, the Führer attended the launching ceremony of the Bismarck, and expressed his congratulations, “With these fervent wishes the German Nation salutes its new battleship Bismarck!” 6After a few words of Admiral Raeder, the granddaughter of Otto von Bismarck christened the ship. Construction of the Bismarck undoubtedly shocked the whole world, even Churchill praised it as a masterpiece in the history of ship building. On Saturday, 24 August 1940, the ship was finally ready to be commissioned and enter in active service with the Kriegsmarine.

5 FIRE CONTROL, http://www.kbismarck.com/controltiri.html

6 THE CONSTRUCTION, http://www.kbismarck.com/construci.html

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Generally, the design of the Bismarck continued the German style. However, due to the lack of experience of German engineers, a large number of design on the Bismarck, such as turrets and armor, drew on the experience of the Bavarian class battleships of World War I, which appeared to be relatively backward, such as dome armor protection, vertical main armor belt, weak upper armor, light armor belt at the head and tail of the warship and torpedo launch tube. Therefore, although the Bismarck battleship, which concentrated all the financial resources of Germany at that time, greatly restricted its combat effectiveness due to the backward design concept

Operation Rhine Exercise

After Operation berlin, a series of raids on Allied shipping carried out by battleships Scharnhorst and Gneisenau began in late January 1941, Germany's naval leadership had immediately begun to plan a bigger operation for the new moon period of late April.

Originally, when formulating the Rhine exercise plan, Reidel did not intend to use the Prinz Eugen, but had both Scharnhorst and Gneisenau involved in the operation, However, the main engine of the Scharnhorst was under heavy repair. The Gneisenau was out of action for 6 months after hit by a Coastal Command torpedo bomber dropped by British aircraft in Brest. As a mine explosion near the Prinz Eugen damaged that cruiser, Rhine Exercise was forced to postpone until the next new moon period at the end of May. 7This left just the Bismarck and the Prinz Eugen available to the Kriegsmarine.

The operation was in command of Admiral Günther Lütjens, who had successfully severed allied supply lines in Operation berlin. He disagreed with time of the operation arranged by Reidel. Lütjens preferred to wait until at least one of the battleships could return to fllet; delay would also allow use of the Bismarck’s sister ship, the Tirpitz, which was currently working up in the Baltic. He was also concerned that the summer months were the time of long daylight in northern latitudes, making it difficult to break clear of any enemy ships that had made contact.

On May 19, the Bismarck, accompanied by the Prinz Eugen, sailed out of the port of Gdynia in Poland for the Atlantic Ocean. However, the two ships were found by a S9 Osprey from a Swedish Navy cruiser the Gotland 8while passing through the katgart Strait, and the Royal Navy was informed immediately. Aware of the power of these two ships, the British Army mobilized all the naval forces they could muster to attack, including two carriers the Ark Royal and the Victorious, two new battleships, the King George V and the Prince of Wales, the powerful post-war Rodney, and two battle cruisers: the Hood and the Repulse, also the Revenge and the

7 Evan Mawdsley, The War for The Seas,2019,101-02.

8 OPERATION RHEINÜBUNG http://www.kbismarck.com/operheini.html

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Ramillies, and more than 20 cruisers and destroyers. A large number of British warships and soldiers divided into four routes, ready to encircle and intercept German ships.

At 19:22 on May 23, the Bismarck was discovered by the British cruiser the Saffrok in the northern part of the Danish Strait.9 The Prince of Wales and the Hood, commanded by Admiral Holland at the western end of the Danish Strait, immediately went to intercept. At 0552 on May 24, when the British and German warships were 23.5 km apart, the 381 mm main gun of the Hood fired first. One minute later, the Prince of Wales, 950 meters away from the hood, also began to fire. Gunners on both British ships initially mistook the Prinz Eugen that was now in lead for the Bismarck, and targeted her. At the same time, German ships began to concentrate fire on the "hood". Admiral Holland turned towards the enemy to close the range as rapidly as possible, but the angle of approach restricted the fire from the rear turrets of his ships and provided a better target for the German guns.

At 0555, when the prince of Wales had just finished a volley, a 203 mm shell of the Prinz Eugen hit the port mast of the hood, detonating 102 mm shells and anti-aircraft rockets on the deck. The fire was very strong, and the ammunition stacked nearby was successively detonated. However, despite all this, the Hood continued to shoot at the Bismarck at a speed of 28 knots.

After the fifth salvo from the Bismarck at 6.00 am, one or more of the Hood's magazine exploded. The Hood, the Mighty Hood, pride of the Royal Navy and during 20 years the largest warship in the world, split in two and sank in three minutes. Subsequently, turrets of two German ships turned to the Prince of Wales, causing her to suffer heavy damage and withdraw from the battle.

Chase of the Bismarck

Although the Battle of the Denmark Strait was a defeat for the Royal Navy, it also had fatal consequences for Operation Rhine Exercise. Unlike the Hood, the Prince of Wales had at least succeeded in damaging the Bismarck. She had in fact achieved three straddles with three hits out of a total of 18 salvoes. As a result of these hits, the top speed of the Bismarck was reduced to 28 knots. However, the loss of fuel was to affect the remaining course of action.

After the battle in the Denmark Strait, Admiral Lütjens made a decision that he would take the Bismarck to Saint-Nazaire for repairs. The Prinz Eugen, which was undamaged, maintained her course and left the formation to stay in the Atlantic to attack enemy convoys on her own. at 1800.10

The Bismarck closed on the Suffolk, and at 1830 opened fire from 18,000 meters but the cruiser quickly retired under a smoke screen. Subsequently, the Bismarck

9 Evan Mawdsley, The War for The Seas,2019,105-07.

10 Evan Mawdsley, The War for The Sea,.2019,105-07.

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became engaged with the Prince of Wales at long distance, and after an exchange of salvoes the fire ceased at 1856 with no hits for both sides.

At 2210, the Victorious had arrived in the war zone, and Swordfish torpedo plane on board was eager to attack. At 2300, Swordfish took off and launched an attack at 0:00 on May 25, one Swordfish lost contact with the rest of the squadron in a cloud layer, and only eight planes proceeded to attack around midnight. Due to poor weather conditions and low visibility, the Bismarck was out of touch at 3:00 on the 25th.

After more than 31 hours since the contact was broken, the Bismarck had been located again on the 26th. Since the Rodney and the George V both had a lower top speed than the Bismarck, the best hope of intercepting her for the British was to launch an air strike from the Ark Royal.11

The attack at 1450 has failed because British targeted a wrong ship. The last attack started at 1915, another group comprised of fifteen Swordfish took off from the Ark Royal. They knew this was their last real chance to stop or at least slow down the Bismarck. If they failed again, the Bismarck would reach the French coast on the next day. During the course of the attack, the Bismarck received at least two torpedo hits. The damage to Bismarck was so serious that at 2140, Admiral Lütjens sent the following message to Group West: "Ship unable to manoeuvre. We will fight to the last shell. Long live the Führer".12

From that time to the next morning on 27th, the Bismarck suffered from several attack from destroyers. A few hours after sunrise at 0722, the King George V and the Rodney, a more lethal team than the Hood and the Prince of Wales, caught up with the staggering German battleship.

This time the Bismarck had to fight alone. Her forward superstructure and bridge was totally destroyed by the 16-inch guns of the Rodney. There was a real possibility that Admiral Lütjens was killed in this salvo.13

Finally, the Bismarck capsized and sank at 1039 in the approximate position of 48º 09' North, 16º 07' West, within quadrant BE 5336.

Analysis and Evaluation

The first and the only operation of this tremendous battleship was one of the most dramatic naval actions during World War II. For the German Navy the sinking of the battleship Bismarck was probably the heaviest single blow of the war. The

11 José M. Rico, THE CHASE OF THE BISMARCK, http://www.kbismarck.com/bismarck-chase.html

12 José M. Rico, THE LAST STAND OF THE BISMARCK, http://www.kbismarck.com/bismarck-last-battle.html

13 Evan Mawdsley, The War for The Seas,2019,107-08.

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loss of the Bismarck marked a turning point in the war on Allied merchant shipping, which made the Germans concentrated their efforts in the U-boats instead of heavy surface warships for raiding purposes in the Atlantic.

This operation was almost doomed from the beginning. Raeder neglected opinions of Lütjens and insisted on using only two ships to form a fleet. The main reason for his arbitrary was the upcoming Operation Barbarossa, where the Kriegsmarine was going to play only a small, supporting role. If he could preemptively cut out the lifeline of the British in Atlantic, Hitler may reconsider the cut of budget in the capital ship.

Meanwhile, A balanced preview of the Bismarck operation should have taken into account the quantitative and qualitative superiority of the British forces in the Atlantic. Although a part of military forces was trapped in the Mediterranean, the number of ships in Atlantic and development of equipment of the Royal Navy were far more advanced than the Germans had expected.

For one of the reasons, the German intelligence service also fell behind. Since as early as 20 May, the German battle group had already been detected in the Kattegat. The long telegram sent by Lütjens on May 25 was a devastating mistake.14 If the British army did not rely on this telegram to locate its position, the Bismarck would had reached France, undoubtedly been welcomed as the greatest hero.

Another reason that has to be mentioned is logistics. The Bismarck did not refuel during brief stay anchored in Norway, which made her had to reduce the speed after a serious fuel leak. We could make a glorious assumption that, if the Bismarck has enough fuel, it can definitely use its high speed to reach the coast where were under aircraft protection before arrival of the Royal Navy. The shortage of intelligence and logistics were exposed long before Operation Barbarossa was carried out, but not attracted the attention of the German army and Hitler.

It is undeniable that sink the Hood was the last glory of big ship and cannon doctrine. The aircraft carrier had revealed itself as a decisive weapon and soon was to replace the battleship as the ultimate warship. It was a torpedo from Swordfish that jammed her rudder machinery. From first to last, the Bismarck did not receive a little bit help from the air. In fact, during the fierce battle in the Atlantic, the British carrier on aircraft were far less than the German Air Force military aircraft in the same period. Due to short sight of sea power, development of aircraft carriers was severely restricted in Nazi Germany. In April 1943, the only carrier in use, the Graf Zeppelin was scuttled by the German themselves.

Today, the battleship era is long gone, but the story of the Bismarck still fascinates people all over the world and her legend is still unforgettable. Although she was designed and built to achieve the evil military strategies of the Nazi.

14 José M. Rico, THE LAST STAND OF THE BISMARCK, http://www.kbismarck.com/bismarck-last-battle.html

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However, as a product of outstanding human engineering, she is still of great significance to review it again.

Acknowledgement:

I really appreciate Professor John Merriman who gave me a whole new perspective on history. With his help, I learned to analyze the background of the times after historical events. Also, I must express my gratitude to assistant Shang Yuan, who recommended several references to complete my work.

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