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Gaining Relevance in the Face of Obsolescence: The USS Texas – a Battleship in the Second World War

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Gaining Relevance in the Face of Obsolescence: The *USS Texas* – a Battleship in the Second
World War

A Thesis

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University of New Orleans
in partial fulfillment of the
requirements for the degree of

Master of Arts
in
History

By

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Abstract

Despite the vast material that has been written about the Second World War, most literature mentions battleships in passing, giving little attention to a role that battleships filled- that of naval gunfire support for amphibious landings. The literature regarding the Navy's older, obsolescent battleships such as the *Texas* is scarce. Using primary sources regarding the *Texas* and the evolution of naval gunfire doctrine from the pre-war and wartime periods, this study looks at the involvement of the *Texas* in the Second World War and how the Navy employed its oldest battleships. The amphibious landings of the war provided a role in which a ship's speed and range became irrelevant when firing on fixed targets on an enemy beach. This work provides a look at a little discussed, though widely used aspect of the Second World War and helps further discussion regarding the evolution of the US navy.

United States Navy, USS *Texas*, Naval Gunfire, Battleship, Amphibious Warfare, Shore Bombardment, World War Two, D-day, France

1: Introduction

From the birth of the United States Navy ships-of-the-line were the spearhead of the United States Navy. Reminiscent of their wooden-hulled and sail-powered predecessors, American battleships were heavily armed and prepared to protect American interests in any corner of the globe. In early 1941, America's great battleships, though still the spearhead of the Navy, were in a position of obsolescence. The first new American battleships since the 1920s were commissioned in 1941 with main batteries of nine 16-inch guns and top speeds of twenty-seven knots. The existing American battleships became comparably slow (top speeds were about twenty knots) and outgunned with the 14-inch gun dominant among the old, slower ships.

America's War Plan Orange originated in the first decade of the twentieth century under President Theodore Roosevelt. Part of a series of war plans color coded to represent various potential belligerents, Japan was given the designation Orange. War Plan Orange was America's joint army-navy strategy for war in the Pacific against Japan. From the first draft until America's declaration of war against Japan in 1941, war planners

revised and refined the plan. The basic concept of Orange was that the Japanese would first target the Philippines, where American forces would hopefully hold out for several months. Once the American fleet arrived in the Pacific, it would aid the American defenders until the US Army arrived to save the defenders. The US fleet would fight the Japanese on the seas until a major battlefleet action resulted in Japanese capitulation. Although War Plan Orange accurately predicted many of the events of World War Two, a decisive battlefleet action against Japan never occurred.

As the Second World War evolved, old American battleships served in three main roles: convoy escorts, anti-aircraft artillery, and naval gunfire support for amphibious landings. As the

Marines advanced across the Pacific island by island and the Army invaded North Africa and Europe, providing naval gunfire support for the invasion landings became the main task of the older battleships.

Following the service of the battleship USS *Texas* and its role in the Atlantic theater's largest amphibious landing, the invasion of France, this paper describes how the United States Navy readjusted the traditional roles of its battleships, particularly those from the early part of the twentieth century, in the midst of war. By studying action reports, general orders, and other prewar and wartime documents, and by looking at several secondary sources which address the fleet problems and fleet landing exercises, we can understand how the US Navy planned to employ, and how they actually did employ, the battleships of the fleet in the next war. Finally, we can see the development of naval shore bombardment in support of amphibious operations during the first few years of the Second World War. Although the focus is on one ship, it is representative of the four oldest battleships which participated in major actions in the Atlantic Theater.¹ The *Texas* was present at every major land invasion and thus can be regarded as a fair representation of the actions of the other battleships in the fleet. Even though she never participated in the role for which she was designed, the *Texas* earned five Battle Stars for her participation in the Second World War.

¹ These four ships were the *USS Arkansas (BB33)*, *USS New York (BB34)*, *USS Texas (BB35)* and *USS Nevada (BB36)*.

2: The Origins of American Battleships

Despite the fact that by the 1880s, the American Navy had had nearly nine decades of distant naval operations, Secretary of the Navy William E. Chandler (1882-1885) spoke against the building of battleships by denouncing any global missions for the United States Navy. He argued that ships necessary for global missions were not the type of continental coast defense vessels America needed. He asserted that the focus should be on economical defense of the coast by monitors, as it had been since the Civil War. The call to build modern ships for the American navy had its origins in the 1870s, and was strengthened by many factors in the following decades. During the 1880s, many young officers in the Navy began to push for the development of new ships. Lobbying by naval officers showed Congress that America needed modern ships. When the British announced they would build ten steel battleships with large guns, Rear Admiral Stephen B. Luce, the Navy's intellectual leader, urged the building of an American battleship fleet.

Many historians, such as William McBride, have put the origins of the American battleship under the administration of Secretary of the Navy Benjamin Tracy (1889-1893).² Influenced by Alfred Thayer Mahan's book, *The Influence of Sea Power Upon History, 1660-1890*, "Tracy called for the creating of a fighting force based upon 'sea-going battleships.'"³ Initially all the United States could provide was the armored ABCD ships, the *Atlanta*, *Boston*, *Chicago*, and *Dolphin*; and "four modern heavy cruisers: *Texas*, *Maine*, *New York*, and *Olympia*."⁴ These were inferior to the battleships under construction in Great Britain and did not satisfy Tracy's desire for a strong American Navy. After a disastrous typhoon in the Pacific,

² William M. McBride, *Technological Change and the United States Navy, 1865-1945* (Baltimore & London: The Johns Hopkins University Press, 2000).

³ McBride, *Technological Change and the United States Navy*, 42.

⁴ Ibid.

which practically destroyed American naval power, Tracy had a stronger argument for building battleships. This ultimately resulted in the Naval Bill of 1890, which authorized \$18 million for three new battleships. Thus began the reign of the battleship in the American Navy.

Another vital factor in battleship building was the Endicott Board, led by Secretary of War William Endicott. Appointed in 1885 by President Grover Cleveland, the Endicott Board was a mix of army and navy officers and civilians brought together to investigate American coastal defenses. Their report in 1886 recommended that twenty-six coastal locations to have updated armament along with floating support batteries, submarine mines and other updated defenses. Funding for the recommended projects began in 1890, and as a result established a system of government contracts to the private sector for building. This combination of public and private policy meant that even during depressions the government would keep factories operating. Therefore, despite an economic depression in 1893, factories were still capable of large scale production needed to produce battleships authorized in 1895.⁵

President Theodore Roosevelt helped cement the battleship as the centerpiece of the American Navy with the cruise of the “Great White Fleet” in 1907-1909. Sixteen battleships, along with various escorts, cruised around the world. The fleet covered roughly 43,000 miles and made a total of twenty port calls on six continents.⁶ The impact of this cruise lingered into the interwar period and arguably beyond. It served to deliver the message that “the United States had come of age as a world naval power” and that the battlefleet, and therefore the battleship, was America’s new first line of defense, capable of meeting challenges at any corner of the globe.⁷

⁵ Allan R. Millett & Peter Maslowski, *For the Common Defense* (New York: The Free Press, 1984).

⁶“The Great White Fleet,” Naval History and Heritage Command, accessed September 21, 2012, <http://www.history.navy.mil/faqs/faq42-1.htm>

⁷ Millett & Maslowski, *For the Common Defense*, 320.

3: Building the USS *Texas*

The Newport Conference held in 1908 resulted in the creation of two new classes of battleships, the *Wyoming* and *New York*.⁸ In his work on American battleships, Norman Friedman explains that the largest influence on the design of the *New York* and *Wyoming* classes was the need for larger caliber main guns. Friedman further argues that it was the belief at the time that the international standard would rise above twelve inches. The Navy knew it must equip the newer ships with larger guns, as the British were known to be constructing a 13.5-inch gun, and the Germans were expected to abandon their 11-inch guns for a larger weapon. Three ship designs with various gun sizes and numbers were drawn up. The choice in final design had to consider the capabilities of ship yards, dry docks and harbors.

In March, 1909, Congress authorized two new *Wyoming* class battleships, the USS *Wyoming* (BB 32) and the USS *Arkansas* (BB 33).⁹ The *Arkansas* and *Wyoming* were still armed with 12-inch guns, though a larger and more powerful variation than previous ships. Although these new 12-inch guns were powerful and accurate, the General Board, in charge of battleship design, still wanted a 14-inch gun.¹⁰ Upon successful testing of a 14-inch gun in January of 1910, the General Board made the decision to arm the next two battleships with the

⁸ Battleship classes were traditionally named after the first ship in the class. The *Wyoming* was Battleship 32, or BB32, therefore the class was named the *Wyoming* class, and consisted of Battleships 32 and 33, the *Wyoming* and the *Arkansas*.

⁹ In 1920, after the confusion in World War I regarding mailing correspondence and shipping parts to ships, the acting Secretary of the Navy Admiral Robert E. Coontz approved General Order No. 541. This order created a standardized system of alpha-numeric symbols with which to identify ships by type and number. For example, the *Texas* was BB35, the thirty-fifth authorized battleship. Each craft type had such a designation, which was termed a hull classification symbol. This system remains in place today.

¹⁰ The General Board was a body formed to advise the Secretary of the Navy on policy and strategy matters. It was in existence from 1900 to 1950. Members were officers of senior to mid-grade rank. Part of the responsibility of this group was discussion and decision making in regards to shipbuilding.

14-inch gun.¹¹ In 1910, the *USS Texas* (BB 35) was authorized by Congress as part of the *New York* class of battleships.

The *Texas* was designed to have ten 14"/45 guns in five twin mounts, two forward and three aft. With each of the five turrets weighing 532 tons, the new 14-inch guns resulted in construction challenges and an overall increase in ship displacement. The 14-inch guns outweighed the 12-inch guns by roughly nine tons and the corresponding weight of the shells and powder needed further increased displacement. Two reciprocating engines made the *Texas* more efficient than earlier turbine powered battleships despite a heavier displacement. One change that had to be made was to the armor. The formula for determining a ship's armor is that a ship must have protection against a shell of the same caliber that its guns fire. With the increase from the 12 to 14-inch gun, the armor on the *Texas* was increased from the *Wyoming* class designs.

The *Texas* and *New York* were unique in that they were to only two battleships in which 14-inch ammunition was stored and hoisted in a nose down position. With the exception of a manual breech, all operational functions of the gun systems were electrical. Maximum elevation was 15° and maximum range was 23,000 yards. Ten magazines held roughly one-thousand 14-inch shells. Upon commissioning in 1914, the *Texas* also had twenty-one 5"/51 single mounted guns. There were four 21-inch torpedo tubes in the hull.

The hull was double bottomed, and the inner bottom went to the third deck. This created a solid structure where the side belt armor was mounted. Face-hardened armor was used on the conning tower, barbettes, turret faces and fronts, vertical side armor, and some bulkheads. Non face-hardened armor was used for other locations. The ship was powered by two steam powered

¹¹ The General Board was created by the Secretary of the Navy in 1900. Descended from the Strategy Board that had planned wartime operations, the General Board was solely an advisory group. The Board was made up of naval officers, and after a reform in 1908, the Board on Construction was eliminated, it was given responsibility for ship characteristics. The General Board was responsible for the characteristics of every battleship from 1908 on.

engines. Fourteen boilers supplied steam to the engines. At the time of construction, the design of the *Texas* was:¹²

Design Displacement	27,000 tons
Overall Length	573 feet
Waterline Length ¹³	565 feet
Beam	95 feet 3 inches
Hull Depth	48 feet 8 ¼ inches
SHP (trial) ¹⁴	28,850
Speed (trial)	21 knots
Main Battery	10 – 14in/45
Secondary Battery	21 – 5in/51
Endurance	9,600 nm @ 10 kts 3,700 nm @ 20 kts
Boilers	14 coal burning
Coal	2960.4 tons
Compliment	58 officers 994 enlisted men

A ship's design is based on its intended use, and the battleships commissioned between 1912 and 1916 reflected the new strategic direction of the United States Navy. The new, forward strategy of the Navy required heavily armed ships with long ranges. As a result, the *Texas*, upon commissioning had a range of 7684 nautical miles at a speed of twelve knots, as compared to the *North Dakota* (BB29) which had a range of 6560 nautical miles at a speed of ten knots upon commissioning in 1910.¹⁵

¹² Norman Friedman, *U.S. Battleships: An Illustrated Design History* (Annapolis: United States Naval Institute, 1984), 436.

¹³ The waterline length is significant due to its relevance to a ship's speed. The speed of a ship is partially determined by her length at the waterline, making any longer length above that line irrelevant to speed.

¹⁴ SHP is the shaft horse power, the power measurement for steam turbines.

¹⁵ Friedman, *U.S. Battleships*, 432, 436.

4: 1920s Battleship Modernization

In 1922, during the Washington Naval Conference, representatives from the United States, the British Empire¹⁶, France, Italy, and Japan signed the Five-Power Treaty, agreeing “to limit their respective naval armament.”¹⁷ In his opening address, American Secretary of State Charles Evans Hughes summarized the goal of the conference: “The world looks to this Conference to relieve humanity of the crushing burden created by competition in armament.”¹⁸ In the first article of Chapter I of the Five-Power Treaty, “The contracting Powers agree to limit their respective naval armament as provided in the present Treaty.”¹⁹ The following nineteen articles set out provisions for the suspension of capital shipbuilding programs; the retention, scrapping, replacement and tonnage limits of both capital ships and aircraft carriers; capital ship gun limits; ship conversion; merchant ship armament; giving, selling or transferring of ships to a signing nation. Finally, the United States, Great Britain and Japan agreed “that the status quo at the time of the signing of the present Treaty, with regard to fortifications and naval bases, shall be maintained in their territories and possessions.”²⁰

While the limits placed on shipbuilding greatly affected the American Navy, perhaps the most influential article of the Treaty was Article XIX regarding the status quo of fortifications and naval bases. For the United States, that was all “possessions west of the 180th meridian- that is, the Philippines, Guam, Wake and western Aleutians.”²¹ This provision affected the revised War Plan Orange. A main point of Orange was the importance of bases in the Pacific to defend

¹⁶ Representatives from the British Empire included Canada, Australia, New Zealand, South Africa and India.

¹⁷ “Conference on the Limitation of Armament,” accessed 25 July 2012, http://www.ibiblio.org/pha/pre-war/1922/nav_lim.html

¹⁸ Harold and Margaret Sprout, *Toward a New Order of Sea Power, American Naval Policy and the World Scene, 1918-1922* (Princeton: Princeton University Press, 1940), 152.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Edward Miller, *War Plan Orange, The U.S. Strategy to Defeat Japan, 1897-1945*, (Annapolis: Naval Institute Press, 1991), 75.

against Japan, and various islands had been proposed as bases by planners in the early part of the twentieth century. Before the Washington Naval Treaty, Guam and Luzon had been proposed, but the treaty kept them from being developed as major bases. Work on fortifications in the Philippines was also halted due to Article XIX.

Due to the limitations put on base building and fortification, the US Navy had to find solutions to fighting without bases in distant seas. Solutions had to be found to solve problems of supply, long ranges and endurance. One of these solutions was to modernize the existing battleship fleet. In his book on War Plan Orange, Edward Miller argued that “The great western base was a terrible strategic idea,” as Japanese close proximity would likely destroy such bases, as did happen with the Philippines. The result was that the effects of the battleship modernization, such as increased fuel storage and longer sailing ranges, would be vital in fighting the Second World War.²²

As a part of the modification of War Plan Orange, the *Texas* underwent major modifications from 1925-1927. Modernization would allow the older ships to fulfill the Navy’s need for ships with long sailing ranges that were more sustainable and reliable. One of the most important modifications to ships such as the *Texas* was the conversion from coal to oil.

The largest structural modification was the widening of the hull. Originally built with a 95’3” beam, 5’5” blisters added to each side increased the beam to 106’1” – the widest possible beam which would still allow the ship unrestricted passage in the Panama Canal.²³ These blisters were added to increase torpedo protection. Any torpedo that made contact would have to penetrate both the inner and outer hull before it could cause damage to vital parts. These blisters could also be used to store oil if emergency reserves were required, or they could be flooded with

²² Miller, *War Plan Orange*, 76.

water. This feature allowed the crew of the *Texas* to flood the outboard blister on D-day in order to get the required elevation to hit a target far inland.

The original fourteen coal boilers went to the scrapyard. Replacing them were just six Bureau Express oil-fired boilers. Previously, fourteen boilers had been divided between four firerooms; with the reduction in the number of boilers, only three firerooms were needed. The last fireroom was overhauled and divided into a plotting and secondary battery switchboard operations, store rooms and four oil tanks. With fewer boilers in each fireroom, more space was available for damage control. The reduction in the number of boilers also resulted in the need for only one smoke stack, as opposed to the existing two.

With the modernization of the boilers, the fuel storage capacity of the *Texas* increased. Even with the modification of the third deck coal storage spaces into crew quarters, fuel storage grew from 1,900 tons maximum of coal to 4,600 tons maximum of oil.²⁴ The change in the boilers and the fuel oil storage capacity increased the *Texas*' endurance from 7,684 nautical miles at twelve knots to 15,400 nautical miles at ten knots.²⁵

Another part of the work done during the modernization of the *Texas* was to strengthen armor in two locations. The three inch armor on the second deck, which was made by two layers of 1½-inch plating, was thickened with the addition of 5/8 inch plating on the existing deck. The five turret roofs were similarly thickened.

The Navy had plans to increase the elevation of the main battery guns from 15° to 20°. It was unclear as to whether or not this modification would fall under the restrictive clause of the Washington Treaty.²⁶ Plans were created to perform the elevation increase when the First Lord of the Admiralty denied that the British were increasing the elevation of their guns. If the United

²⁴ Friedman, *U.S. Battleships*, 436-437.

²⁵ Ibid.

²⁶ Friedman, *U.S. Battleships*, 189.

States did so, it would indeed violate the reconstruction clause. Despite a difference of opinion, the American government cancelled the plans.²⁷ The idea did not die with this incident, and the topic would come up again in the 1930s as world events hinted at war.

²⁷ Friedman, *U.S. Battleships*, 191.

5: Battleships in the Interwar Fleet Problems and Fleet Landing Exercises

The United States Navy had been conducting fleet exercises, which were termed fleet problems, since 1889. Fleet problems provided an opportunity for the Navy to address various strategic, operational, and tactical questions. In what would become the interwar period of 1920-1940, many of the problems would address assumptions laid out in War Plan Orange. Often eerily foreshadowing engagements that occurred in the Second World War, planners, officers, and sailors were able to gain important knowledge that would help the eventual Allied victory.

Some new options such as the use of battleships for amphibious landing support were overlooked by naval officers. Problems for the battleships focused on convoy escort and tactical exercises such as battleline maneuvers and attacks on carriers. Some of the joint exercises conducted by the Army, Marine Corps and Navy resulted in naval bombardment covering shore landings. During the 1927 Joint Army-Navy exercise, naval forces that included battleships “bombarded” the defenses of the Panama Canal. The joint critique of the exercise ruled the bombardment ineffective due to air strikes.²⁸

The Marine Corps put more focus on developing naval gunfire in support of amphibious landings. From 1935-1939, the Marine Corps’ Fleet Marine Force conducted Fleet Landing Exercises (FLEX).²⁹ The purpose of these exercises was to test the doctrine in the *Tentative Manual for Landing Operations*. These five FLEXs also represent the majority of experimentation with naval gunfire providing shore bombardment. With the idea fixed that naval shore bombardment was to be equated to field artillery, the main questions regarding the

²⁸ Albert Nofi, *To Train the Fleet for War, The U.S. Navy Fleet Problems, 1923-1940*, (Newport: Naval War College Press, 2010).

²⁹ “A History of U.S. Fleet Landing Exercises” by B.W. Bally, Lt. Col., USMC; “Gunfire Support in Fleet Landing Exercises” by David L. Nutter, Lt. Com., US Navy; “Landing Operations and Equipment” by William F. Royall, Lt., US Navy; “Pictorial Record of Landing Boat Development” by William F. Royall, Lt., US Navy; September 1939. Historical Amphibious File; Box 2, Folder 73. Historical Amphibious File; Gray Research Center, United States Marine Corps Research Library; Quantico, Virginia.

doctrine were type of projectile and the ability of a ship's flat trajectory gun to hit a target on the reverse slope of a landing area.

With the understanding that naval shore bombardment should be carried out in the same manner as a field artillery bombardment on land, initial doctrine leaned toward a barrage style of bombardment. The first three FLEXs (1935-1937) tested this doctrine. It was determined by the end of the third FLEX that the doctrine was sound. FLEX 4 in January-March of 1938 tested the accuracy of destroyer guns against pinpoint targets. After Tarawa in late 1943, pre-arranged, pinpoint target firing became the doctrine for naval shore bombardment. But in 1938 it was just another experiment in a training exercise. In FLEX 5 in January-March of 1939 shore fire control parties were again thoroughly tested, and more emphasis was placed on delivering fire on designated areas and providing deep supporting fire.

Other important aspects of naval shore bombardment were tested during the 1935-1939 FLEXs. Testing was done on the shell type and charge amounts. It was decided that high explosive projectiles were preferable to armor piercing, but that conclusion was drawn by hitting only wooden targets. Testing was not done on more realistic targets, that is, on concrete bunkers. Comments in the review of gunfire support in the exercises written by Lieutenant Commander David Nutter, USN, hint at planners believing amphibious landings would be contested on the beach by manpower. Therefore, the navy tested the effects of bombing against personnel and the effectiveness of effects of various projectiles. Both air spotting and shore spotting were tested. The ability of both spotters and ships to quickly shift targets was another important experiment of all five FLEXs. Although many important lessons were learned from the FLEXs, naval gunfire doctrine was in its infancy, and important changes would not be made until after the experiences at Tarawa.

During the interwar period other battleship capabilities were recognized. One idea regarding battleships that proved to be true in the coming war was the strength of battleships against air attacks, especially in open water.³⁰ This was due in part to the structural strength of the ships and to large numbers of anti-aircraft installed on these ships. Older ships such as the *Texas*, which were not initially supplied with large numbers of anti-aircraft weapons, were modified and given increased anti-aircraft batteries, especially when assigned to the Pacific theater. In the case of the *Texas*, in 1927 it had eight 3"/50 Mk 21 guns. By 1941 two more had been added. By December of 1944, the *Texas* had also been outfitted with forty-four 20mm Mk10 guns and ten 40mm quad mounts.³¹ The strength of battleships against aerial attack was further exploited during the Second World War, as battleships would often be put in between the carrier forces and the likely direction of enemy attacks. They provided irresistible targets to airmen, but were able fight off attacks with a high success rate. Battleships' invulnerability to air attacks also made them a perfect addition to landing bombardment forces.

What is evident in the fleet problems of the 1930s is that by December of 1941, naval minds still believed that battles would be won or lost by ship-to-ship engagements. That carrier launched planes could provide support of amphibious landings, protection of fleets could be strengthened by destroyers and cruisers, but that battleships were still key to naval warfare. Although the US Navy had used battleships as support for carriers in some fleet problems, and carrier tactics and deployment had been greatly advanced, the attack on Pearl Harbor would turn the tide of naval warfare and forever change the role of battleships in the United States Navy.

³⁰ In his book, *To Train the Fleet for War*, Albert Nofi explains that sixteen battleships or battle cruisers (including all participants in WWII, not just Allied) were sunk during the war due to air attacks. Twelve of those were moored or at anchor when hit. Contrast that to the nine battleships sunk by surface gunnery or torpedo attacks.

³¹ A full chart of the change in armament on the *Texas* is in Appendix E.

6: Naval Gunfire in Support of Amphibious Landings in the Interwar Period

“Battleships, as a type, are designed for the purpose of inflicting maximum damage upon an enemy while, at the same time, withstanding punishment. The development of skill in battleship evolution and maneuver, singly or in combinations, has, as its ultimate objective, the attachment and maintenance of relative positions favorable for the exercise of these functions.”³²

This introduction from the 1938 *Battleships, Battle Force, U.S. Fleet Bulletin of Tactical Information*, summarized the battleship’s place in the interwar age. Although the bulletins from the 1930s focus on battleships as a ship of the line, as early as 1928 the Navy considered the use of battleships to provide naval gunfire for amphibious landings.

Speaking to a group at the Marine Corps School at Quantico, Virginia, in March of 1928, Commander H. M. Lammers, USN, addressed some of the issues of naval gunfire in support of landing operations. Lammers opened with the truth that being separated from all of the world’s great powers by vast oceans, a decisive blow in any future war would have to involve taking advanced bases in order to shorten the distance between our forces and the enemy (War Plan Orange basics). His speech was entitled “*Naval Gunfire in Support of a Landing*” and discussed the potential of using existing ships to cover amphibious landings.³³

Lammers, like so many at the time, focused on comparing naval shore bombardment to land artillery bombardments based on the experiences of the First World War. The doctrine of neutralizing an area with saturating fire was practiced in the FLEXs of the 1930s. Although the final two exercises in 1938-1939 included the practice of hitting some specific targets of

³² “Battleships, Battle Force, U.S. Fleet Bulletin of Tactical Information 1938;” Registered Publications Section; U.S. Navy Technical Publications 1901-1960; Records of the Office of the Chief of Naval Operations, Record Group 38; National Archives at College Park, College Park, MD.

³³ Commander H.M. Lammers, USN, “Naval Gunfire in Support of a Landing.” Speech to the Marine Corps Schools Marine Barracks, Quantico, Virginia, 2 March 1928; Strategic Plans Division Records; Lectures and Speeches (Series I); Records of the Office of the Chief of Naval Operations, Record Group 38; National Archives at College Park, College Park, MD.

opportunity, the doctrine of firing on pre-assigned, pinpoint targets did not become the standard doctrine until the experiences from the landings at Tarawa. What Lammers' speech represents is one of the early efforts of the Navy and Marine Corps to discuss naval shore bombardment, and the many problems which would need to be answered. The FLEX problems which came in the following decade tested many types of ammunition, spotting, and particulars of hitting targets out of site, i.e. hitting targets on the reverse slope of a hill. Certain arguments made by Lammers continued to be a point of discussion until the outbreak of war. These issues included types of ships for bombardment, types of spotting, and ammunition, and would be tested and tried even through the Second World War.

One particular argument Lammers made was that battleships were less vulnerable to shore battery fire than other types of ships and suggested their combination of large caliber guns and armor made them ideal for participation in shore bombardment. The *Texas* would indeed prove this point in post D-day action against a German battery off of Cherbourg. On 25 June 1944 the *Texas* took two direct hits from German shore batteries. One shell, believed to be eight inches in caliber, hit the conning tower. It sheared off the top of director three, dropping it onto the fire control tower. It then exploded against the longitudinal frame of the foremast. This explosion resulted in an upwards blast, which sheared off floor plates in the navigation bridge and rendered "steering gear, compasses, engine room telegraph, engine revolution indicator, I.C. circuits, electric cables and voice tubes" severed and useless.³⁴ Despite this hit, which also resulted in eleven casualties, including one killed, the *Texas* continued to fire on its targets. During the same bombardment period, the *Texas* took a hit from a 240mm shell, which

³⁴ Action Report - Report of Bombardment of Cherbourg, 26 June 1944, written by the Commanding Officer, USS *Texas*, Captain Charles Baker; Records Relating to Naval Activity During World War II; WWII Action and Operational Reports; Records of the Office of the Chief of Naval Operations, Record Group 38: National Archives at College Park, College Park, MD.

penetrated between forward frames and fell onto the deck of a room in Warrant Officers' country. Fortunately for the crew of the *Texas*, this shell did not detonate. The shell was, however, left in place for the duration of the engagement and removed upon the ship's return to Portsmouth, England.³⁵

Despite his belief that battleships could withstand hits during shore bombardment, and despite his belief that their large caliber guns could be effective, Lammers had some doubts as to the extent of battleships' effectiveness. One concern of naval officials since the limitations placed on capital shipbuilding in the Five-Power Treaty was gun elevation. During the 1920s modernization, naval officials wanted to increase elevation of the main battery on the *Texas* from 15° to 20°, but were denied this change by the treaties. Lammers also discusses this handicap in his 1928 talk at Quantico. Although Lammers discusses elevation as a means to increase range with a decrease in velocity in order to prolong gun life, the topic was one of continued discussion throughout the prewar years.³⁶ Lammers' further concerns with battleships included the accuracy and range of the guns, the capabilities of fire control, and whether or not naval ordnance would be effective. On all points, his concerns proved to be unmerited. Developments in the interwar period improved fire control, and with the improvement of aviation, and especially aircraft radios, aerial spotting became quite dependable. Naval ordnance proved to be lethal to coastal defenses, especially to smaller pillboxes and machine gun nests. As for the range and accuracy of the guns, naval shore bombardment continued to be used and refined during the war, which proved these were problems which could be overcome.

³⁵ Action Report: Bombardment of Cherbourg, 26 June 1944; Record Group 38, National Archives at College Park, College Park, MD.

³⁶ Lammers, page 11; National Archives at College Park, College Park, MD.

7: Gun Elevation – a Turning Point

Unrestrained by treaties during the fall of 1939, navy officials discussed making changes to the battleships of Battleship Division Five, which consisted of the *Arkansas*, *Wyoming*, *New York*, and *Texas*. The Chief of Naval Operations, Admiral Harold Stark, deliberated with directors of various divisions, such as the War Plans Division and Fleet Maintenance Division about increasing the elevation of the main battery guns on the four older ships to 30°. The Bureau recommended that the *Wyoming* was not worth modernizing, and it so it remained a training ship.³⁷ The elevation increase work was expected to take twenty-one months for the *New York* and *Texas* and twenty-six months for the *Arkansas*.

From the beginning of these discussions some navy officers thought that the current state of world affairs made it unwise to put these ships out of commission for lengthy periods. In another memo from November of 1939, the Director, War Plans Division, states that the three ships in question represented one-fifth of the US battleships, but that by the time alterations could be made, the *North Carolina* and *Washington* would be finished.³⁸ Six more battleships might be available just as soon. With the addition of these eight new battleships, the relative value of the *Arkansas*, *New York* and *Texas* would materially decrease.³⁹ The Director, War Plans Division, made two important arguments in his November 1939 memo that:

³⁷ Director, Fleet Maintenance Division to Chief of Naval Operations; Memorandum regarding Battleships of Division 5, 15 November 1939 ; Strategic Plans Division Records; Subject Files, 1937-1941 (Series V); Records of the Office of the Chief of Naval Operations, Record Group 38: National Archives at College Park, College Park, MD.

³⁸ Director, Fleet Maintenance Division to Chief of Naval Operations; Memorandum regarding Battleships of Division 5, 8 November 1939 ; Strategic Plans Division Records; Subject Files, 1937-1941 (Series V); Records of the Office of the Chief of Naval Operations, Record Group 38: National Archives at College Park, College Park, MD.

³⁹ Ibid.

- (a) Elevation of the guns would permit these vessels to be in the battle line, which they cannot do now. In this connection, it may be pointed out that the Japanese Navy now has 18 capital ships, built and building (10 built and 8 building), whereas, even with these three vessels, we have only 23 (15 built and 8 building).
- (b) As escort for Fleet train, or for important merchant convoys, or for general protection of communication lines against raids, the increased elevation plus efficient A.A. guns would eliminate the handicaps the NEW YORK, TEXAS, and ARKANSAS now suffer in comparison with 8" gun high elevation cruisers and would permit efficient defense against aircraft. As the vessels are now, their value for the above purposes is doubtful.⁴⁰

At the time these two points were considered advantages to altering the old battleships. In 1940, "in view of the present international situation," the Chief of Naval Operations decided not to have gun elevation work done on the *Arkansas*, *New York* and *Texas*. The decision to not elevate the guns on the three oldest battleships left these ships with a severe disadvantage. They could not keep up with a modern battleline due to their slow speeds. Without the increase in gun elevation, their shorter range capabilities might prove fatal in any surface engagement.

Battleships served in a variety of roles during the Second World War. Although over half the US Navy battleships were too slow for the carrier force, they still filled vital roles. The possibility of nighttime engagements was still open to the older ships, as darkness was a great equalizer. In the final ship to ship engagement of World War Two, older American battleships proved themselves more than capable. In late October of 1944, the nighttime battle at Surigao Strait showed that the old battleships could still fight. The battleline of Rear Admiral Jesse Oldendorf's Task Group 77.2, was comprised of six old battleships, five of them Pearl Harbor survivors. They were *California*, *Maryland*, *Pennsylvania*, *Tennessee*, and *West Virginia*. The sixth ship was the *Mississippi*, which had been in Iceland on patrols in December of 1941. These battleships, the newest of which, the *West Virginia*, had been commissioned in 1923, were not

⁴⁰ Director, Fleet Maintenance Division to Chief of Naval Operations; Memorandum regarding Battleships of Division 5, 8 November 1939; Record Group 38: National Archives at College Park, College Park, MD.

handicapped by low gun elevations like the *Arkansas*, *New York*, *Texas*, and *Nevada*. In the last great ship-to-ship battle of World War II, the battle line of old ships, led by Rear Admiral George Weyler, performed what every battleship commander dreamed of: they capped the Japanese T.⁴¹ Hemmed in by the islands of the strait, the American battleships, along with cruisers, destroyers, and patrol torpedo boats, decimated the Japanese force of fourteen battleships, destroyers, and cruisers.

⁴¹ Samuel Eliot Morison, *History of United States Naval Operations in World War II*, vol.12, *Leyte, June 1944-January 1945* (Urbana and Chicago: University of Illinois Press, 1958), 223.

8: World War Two- The Beginning

In December of 1941, the United States Navy had seventeen battleships: *Arkansas*, *New York*, *Texas*, *Nevada*, *Oklahoma*, *Pennsylvania*, *Arizona*, *New Mexico*, *Mississippi*, *Idaho*, *Tennessee*, *California*, *Colorado*, *Maryland*, *West Virginia*, *North Carolina*, and *Washington*.⁴²

The Japanese bombing of Pearl Harbor cut that number cut down to nine operational ships. Of those damaged at Pearl Harbor, all but the *Arizona* and *Oklahoma* were returned to service by January 1944.⁴³ Commissioned in the spring of 1941, the *North Carolina* and *Washington* were the newest battleships in the American fleet.

Thus at the start of the Second World War, US Navy had a serious deficiency in battleships. The new, fast battleships, the first of which were the USS *North Carolina* (BB 55) and the USS *Washington* (BB 56), both commissioned in 1941, joined the growing carrier task forces. A further eight new battleships commissioned by the Navy were all fast battleships whose speeds increased from twenty-seven to thirty-three knots by the time USS *Iowa* (BB 61) began service. With maximum speeds at around twenty knots, the older battleships could no longer keep up with the fast carrier forces, nor would they be able to keep up speed with the newer battleships, whose top speed, like the carriers, was between twenty-six knots and thirty-three knots.⁴⁴

With a large majority of the battleship force limited by slow speeds, the Navy sought a new role for the old battleships, whose top speeds were at best seven to thirteen knots slower

⁴² Listed in numerical order above, their corresponding numerical designations are BB 33-46, 48, and 55-56.

⁴³ Although still in service in 1941, the *Utah* and *Wyoming* had been converted into training ships in 1930s. The *Utah* was designated AG-16, and used as a radio controlled gunnery target and then used as both a machine gunnery school and gunnery target. She was torpedoed at Pearl Harbor on 7 December and remains there, partially sunk. The *Wyoming* was converted into a training ship and designated AG-17. AG-17 was used by the Navy throughout World War Two to provide gunnery training.

⁴⁴ The North Carolina class, consisting of the *North Carolina* and *Washington* had speeds of twenty-six and twenty-eight knots, respectively. The South Dakota class, consisting of the *South Dakota*, *Indiana*, *Massachusetts* and *Alabama*, all had a speed of twenty-eight knots. The Iowa class ships, *Iowa*, *New Jersey*, *Missouri* and *Wisconsin*, all had a top speed of thirty-three knots.

than their new counterparts. Despite the belief of senior naval officials that older ships, such as the *Texas*, would not be able to provide adequate protection as convoy escorts, they were already part of the Neutrality Patrol ordered by President Roosevelt on 5 September 1939 to deter Axis presence US waters.⁴⁵

In 1939 the Atlantic Squadron was formed. Commanded by Rear Admiral Alfred Johnson, the Atlantic Squadron was comprised of the four oldest battleships in the US Navy, the *Wyoming*, *Arkansas*, *New York* and *Texas*, a division of heavy cruisers, Destroyer Squadron 10, and the aircraft carrier *Ranger*. On February 1, 1941, the Atlantic Squadron was organized under Admiral Ernest King as the Atlantic Fleet. By 1940, battleship patrols, reaching far out into the Atlantic were carried out in order to deter Axis raiders and U-boats. These sweeps against the German raiders increased in 1941, as the situation grew worse for the Allies after the fall of France and the German occupation of French ports. The *Texas* continued to run convoy escorts through the first two years of full American involvement in the Second World War.

By November 1942, the Navy began to use the *Arkansas*, *Texas*, and *New York* for a different task: providing naval gunfire support for amphibious landings. Covering first the Allied landing in North Africa, this new role led these three older battleships to the shores of North Africa, northern and southern France, and the Pacific islands of Okinawa and Iwo Jima where their fire support joined with the new battleships to aid thousands of American soldiers, sailors and Marines who assaulted enemy shores. For the older, slower ships, naval gunfire support became the focus of their wartime employment. The *Texas* would gain significant experience in this new role over the next three years, eventually participating in almost every major amphibious landing in the European Theater.

⁴⁵ Samuel Eliot Morison, *History of United States Naval Operations in World War II*, vol.1, *The Battle of the Atlantic* (Urbana and Chicago: University of Illinois Press, 1947), 14.

9: Evolution of Naval Gunfire in Amphibious Operations in WWII

“Our past conception of the futility of Naval Gunfire was based on the lessons of Gallipoli. However, the technical advances in naval ordnance installations and naval gunnery since World War I have not been fully appreciated.”⁴⁶ This quote from Marine Corps General Order No. 6-43 (10 September 1943) acknowledged the challenge of improving naval gunfire in support of amphibious landings. The first amphibious landing on Guadalcanal on August 7, 1942, was covered by carrier-based air support and cruisers as practiced during fleet exercises. Although the initial landings allowed American forces to establish a force beachhead on Guadalcanal in two days, it would take twenty-six weeks of intense fighting on land, air, and sea to secure the island.⁴⁷ Although there was continuous discussion of naval shore bombardment doctrine, serious changes did not come until the landings at Tarawa in November 1943.

As early as August 18, 1942, the Commander Amphibious Force Pacific Fleet was in the midst of the discussion on improving naval shore bombardment doctrine. Major Frederick Henderson of the Second Marine Division, Fleet Marine Force, at Camp Elliott, California was an early exponent of naval gunfire support⁴⁸ A memo dated August 18, 1942, written by Major Henderson and sent to the Chief of Naval Operations, had an enclosure compared land and naval gun forces. Major Henderson was submitting the enclosure for “consideration and experiment.”⁴⁹ Henderson’s basic premise states:

⁴⁶ “Corps General Order Naval Gunfire Support in Landing Operations,” Annex C; History and Museums Division; Subject File Relating to World War II; Records of the U.S. Marine Corps, Record Group 127, National Archives at College Park, College Park, MD.

⁴⁷ Samuel Eliot Morison, *History of United States Naval Operations in World War II*, vol.5, *The Struggle for Guadalcanal* (Urbana and Chicago: University of Illinois Press, 1949).

⁴⁸ “Brigadier General Fred P. Henderson – Deceased,” United State Marine Corps Biographies, accessed 10 October 2012,

https://slsp.manpower.usmc.mil/gosa/biographies/rptBiography.asp?PERSON_ID=992&PERSON_TYPE=General

⁴⁹ “Employment of Naval Gun Fire in Amphibious Operations,” Written by Major Frederick P. Henderson, USMC, Second Marine Division, Fleet Marine Force, via the Office of the Commanding General at Camp Elliot, California, 18 August 1942, Record Group 127, National Archives at College Park, College Park, MD.

The Fire Support Groups of the Attack Force are the Field Artillery of the Landing Force until the Landing Force Artillery is ashore and in operation. Therefore the assignment and employment of the Fire Support Groups during the preparation and support of Landing Force should follow current field artillery doctrine as nearly as practicable.⁵⁰

The current doctrine was “to deliver a short overwhelming volume of fire on targets selected for neutralization.”⁵¹ The duration of fire was to be two minutes in length at a rapid rate. All guns in a battery were to fire at one range during this two minute period, and all batteries were to fire at the same range, regardless if they were offset.⁵² This concept was not universally accepted. The Marine Corps had already been experimenting with pre-planned, pinpoint targets during FLEXs. The Commanding General, Amphibious Corps, Pacific Fleet at Camp Elliott, California, responded to these ideas by saying: “...this office does not agree that the two (2) minutes of fire will achieve neutralization. This time is arrived at because it is the time required for naval artillery to equal in explosive the land artillery fire to cover an area.”⁵³ He also acknowledged that that until the shore bombardment doctrine could be tested in combat, the discussion on length of fire was just opinion.⁵⁴ This presumption was correct. The initial doctrine of short bursts of fire, expected to saturate and neutralize an area, were found with the experiences in the Pacific to be ineffective. Tarawa revealed that destructive, pinpoint firing on targets was more effective than a traditional land artillery style bombardment for neutralization.

Due to the lack of actual practice and experience, gunnery officers had to calculate the potential effectiveness of naval gunfire. One challenge with these calculations was that the effectiveness of naval guns was compared to, and estimated by, field artillery effects. For

⁵⁰ “Employment of Naval Gun Fire in Amphibious Operations,” Major Henderson, 18 August 1942, Record Group 127, National Archives at College Park, College Park, MD.

⁵¹ Ibid.

⁵² Ibid.

⁵³ Letter from The Commanding General, Headquarters, Amphibious Corps, Pacific Fleet, Camp Elliot, CA, to the Chief of Naval Operations, 2 September 1942; Record Group 127, National Archives at College Park, College Park, MD.

⁵⁴ Ibid.

example, the 14-inch guns on the *Texas* were considered comparable to an 8-inch howitzer. Thus, naval shore gunnery was not shaped by actual capabilities, but by comparison with existing field artillery effects.

In September 1943, the Headquarters Fifth Amphibious Corps issued a new General Order 6-43, "Naval Gunfire Support in Landing Operations."⁵⁵ No longer considered "black magic," the General Order from September 1943 states that "there is little reason to doubt the usefulness of naval gunfire in present day landing operations in the critical phase during which time artillery is not available...."⁵⁶ It was also stated in Annex C of the General Order that:

Naval gunfire has certain distinct inherent advantages. Ship's batteries are always in position and ready to fire due to their fixed installation within the ship. Their ammunition supply is capable of functioning at all times up to the limit of the amount carried aboard. They have a more rapid rate of fire than any field artillery of comparable caliber. When hydrographic conditions permit flank firing positions, enfilade fire may be delivered.⁵⁷

With the established opinion that naval gunfire was then a critical aspect of modern day warfare, the General Order contained the following requirements of naval gunfire support:

- a. The requirements of Naval Gunfire support are based on the following:
 - (1) Sufficient gunfire capabilities to neutralize probable targets on the front and flanks of the landing beaches selected.
 - (2) Sufficient gunfire capabilities to neutralize known and suspected enemy batteries.
 - (3) Sufficient cruisers or destroyers with modern indirect fire control installations to furnish direct gunfire support to each assault infantry battalion.
- b. The requirements of gunfire support enumerated above may be met in most situations by the assignment of the following gunfire supporting ships to each assault team.
 - (1) One squadron of 1500-2200 ton destroyers (8 or 9 ships).
 - (2) Two heavy cruisers (10,000 ton light cruisers).
 - (3) One battleship (any class).

⁵⁵ "Corps General Order Naval Gunfire Support in Landing Operations;" Record Group 127, National Archives at College Park, College Park, MD.

⁵⁶ "Corps General Order Naval Gunfire Support in Landing Operations," Annex C; Record Group 127, National Archives at College Park, College Park, MD.

⁵⁷ Ibid

These classes of ships are of modern type with high fire power and excellent fire control installations.⁵⁸

The general order continued by giving three phases of execution for naval gunfire support. These three phases would only be slightly modified by 1944 when they are listed in the *Allied Naval Assault Gunnery Instructions*:⁵⁹

Phase.	Landing Force Activity.	Type Of Support Required.	Priority Targets.	Observation.
I.	Approach.	Counter battery. Deep support.	Batteries. Major defences. Reserves.	Air. Ship.
II.	Assault.	Close support. Counter battery.	Beach defences. Batteries.	Ship. Air.
III.	Advance.	Close support. Deep support. Counter battery.	Opportunity targets. Strong points. Counter attacks. Batteries.	Shore. Air. Ship.

The continuation of Annex C lays out the methods for observation and fire control and location of targets. Prior to an engagement, ships would receive precise bombardment targets. With the support of aerial spotters and then Shore Fire Control Parties (SFCP), ships were to neutralize or destroy its prearranged targets. Once prearranged targets were destroyed, SFCP and aerial spotters were responsible for identifying targets of opportunity, and then requesting fire from their supporting ship. Every aspect of naval bombardment was laid out in the general order in great detail, finally creating a doctrine for naval gunfire support.

The “Allied Naval Assault Gunnery Instructions” from 1944 detail the procedure for Shore Fire Control Parties as updated for the Normandy Invasion. The SFCP consisted of: one Naval Gunfire Liaison Officer (NGLO); one artillery officer as Naval Gunfire Spotter (NGS);

⁵⁸ “Corps General Order Naval Gunfire Support in Landing Operations,” Annex C; Record Group 127, National Archives at College Park, College Park, MD.

⁵⁹ “Allied Naval Assault Gunnery Instructions, 1944,” Record Group 127, National Archives at College Park, College Park, MD. For the complete descriptions of each phase, see Appendix C.

one Liaison Sergeant; four Radio Operators (code); two Radio Operators (voice); three Privates, basic; and two Privates, wiremen.⁶⁰

Going ashore with the initial infantry wave were the NGS, liaison sergeant, one voice radio operator and two wiremen who were equipped with one SCR609 transmitter and receiver, field glasses, wire equipment, maps and photographs. Once this initial group was ashore and able to make observations, they were to set up the SCR609 and contact their support ship, which was equipped with SCR608 receiver. In the next wave the naval officer, two code radio operators, one voice radio operator, and two basic privates would land. They carried the SCR284 receiver and transmitter as well as maps and photographs. Upon contact with both ship and forward observer, the naval officer relayed fire missions from the forward NGS to the supporting ship. Once possible, the final section of the SFCP would land with one SCR284 mounted on a 1 ½ ton truck. Consisting of the final two code radio operators and basic private, this echelon would report to the NGLO as needed. If the second wave did not include a truck, the second truck would land when possible after the third group. The Naval Gunfire Liaison Officer was attached to a direct support artillery battalion headquarters and to the Division Artillery Headquarter of the Army. The foremost responsibility of the Naval Gunfire Liaison Officer was to forward requests for fire and intelligence to the SFCP and to coordinate naval gunfire for maximum efficiency.

Within just about a year's time, the Navy and Marine Corps had revolutionized thinking about fire support for amphibious landings. When officers realized that aerial bombing would not be enough to defeat a fortified landing site, they changed doctrine. Naval shore bombardment went through rapid change. With this new doctrine, ships such as the *Texas* were

⁶⁰ "Allied Naval Assault Gunnery Instructions, 1944," Record Group 127, National Archives at College Park, College Park, MD.

given a new purpose in war. For the *Texas*, her first real test of this new naval assault doctrine would be the most famous amphibious landing of the Second World War, the invasion of France.

10: The Invasion of France

The invasion of France was divided into two parts: Operation Neptune, the cross Channel phase of the invasion and Operation Overlord, to secure the Normandy beachhead. Command of Operation Neptune went to British Admiral Bertram Ramsey, RN. Organized into five bombardment groups, three American battleships and two British battleships were ordered to provide bombardment along with twenty-five American, British, Dutch, French and Polish cruisers, destroyers, monitors, and sloops of war. The April 1944 version of the Operation Neptune Naval Orders laid out instructions for the bombarding forces on D-day:

Object

2. The object of the naval bombardment is to assist in ensuring the safe and timely arrival of our forces by the engagement of hostile coastal defences, and to support the assault and subsequent operations ashore.

This will involve the following tasks:

- (a) neutralisation of coast defence and inland batteries capable of bringing fire to bear on the assault beaches or sea approaches until each battery is captured or destroyed,
- (b) neutralisation or destruction of beach defences during the final approach and assault,
- (c) support of the army after the assault by the engagement of mobile batteries, counter-attacking formations, defended areas, etc., particularly during that period when the army artillery is not fully deployed.⁶¹

For Operation Neptune, the “*Texas* operated as a unit of the Bombardment Group (TG 124.9) under command of Rear Admiral C. F. Bryant, U.S. Navy, in *Texas*; of Assault Force “O” (TF 124) Rear Admiral J.L. Hall, Jr., U.S. Navy; of the Western Naval Task Force (TF 122),

⁶¹ “Operation Neptune – Naval Operation Orders,” Commander, Eleventh Amphibious Force (COM11THPHIBFOR); Operations Plans and Orders and Other Records Relating to Operation NEPTUNE, 1943-1944; Records of the Naval Operating Forces, Record Group: 313: National Archives at College Park, College Park, MD.

Rear Admiral A.G. Kirk, U.S. Navy, NCWTF.”⁶² The specific mission given to the *Texas* demonstrated the advanced doctrine of naval shore bombardment. The mission “was to neutralize and destroy the 155mm casemated battery (Army Target Number 1) on Pointe du Hoc, east of Grandcamps on the Bay of the Seine, to permit the First and Twenty-Ninth Infantry Divisions of the First U.S. Army to land on the beaches east and west of the Carentan estuary.”⁶³

On the night of June 5, the *Texas* as the flagship of the Western Task Force began the slow journey from her anchorage just off of Plymouth to her fighting location. Anchoring in the Western Fire Support Channel west of Omaha Beach at 0300 on June 6, she remained silent until 0441, when she moved into position to begin bombardment.⁶⁴ Stopping at 0530 and lying to in her bombardment position, the *Texas* turned her port broadside to the beach. Due to a projected tidal current change expected during the bombardment period, she did not anchor, but kept position with her engines. At 0550, positioned roughly 13,000 yards bearing 030° from Pointe du Hoc, the main and secondary batteries opened fired on pre-arranged targets.⁶⁵

The main target for the *Texas* was a coastal defense battery of six 155mm guns, two of which were casemated at Pointe du Hoc on the west end of Omaha beach. Located on a cliff one-hundred feet in height, these six guns had a range of twenty-five thousand yards, and could bombard both Omaha and Utah beaches. This battery was given special attention in the invasion planning as planners believed the destruction of this battery would be essential to the success of

⁶² “Chronological Narrative of Operations of U.S.S. *Texas* for period 3 June 1944-17 June 1944,” Written by the Commanding Officer, USS *Texas*, Captain Charles Baker; Records Relating to Naval Activity During World War II; WWII Action and Operational Reports; Records of the Office of the Chief of Naval Operations, Record Group 38: National Archives at College Park, College Park, MD.

⁶³ “Chronological Narrative of Operations of U.S.S. *Texas* for period 3 June 1944-17 June 1944;” Record Group 38: National Archives at College Park, College Park, MD.

⁶⁴ A map of the initial bombardment positions for Neptune can be found in Appendix F.

⁶⁵ “Chronological Narrative of Operations of U.S.S. *Texas* for period 3 June 1944-17 June 1944;” Record Group 38: National Archives at College Park, College Park, MD.

the invasion. It was bombed three times by American bomber forces prior to June 6, and before H-hour on that same day the *Texas* fired roughly 250 shells into the Pointe du Hoc battery.

Under the command of American Army Lieutenant Colonel James E. Rudder, USA, several hundred men from the 2nd and 5th Ranger Battalions of the United States Army were assigned the task of landing on the beach beneath the Pointe du Hoc cliff and then scaling the cliff to capture the battery. After a delayed landing due to the sinking of one landing craft and a navigation error, Rangers landed on the rocky shore and scaled the cliff. They found that the six had been replaced by dummies made of telephone poles. As a result of heavy aerial bombardment by Allied bombers, the Germans had moved the guns inland before June 6. Moving inland the Rangers found four of the six guns and destroyed them with the use of thermite grenades, finally accomplishing their mission.

Landing in a Landing Craft Vehicle Personnel (LCVP) in the seventh wave on Omaha Beach, *Collier's* correspondent Ernest Hemingway witnessed the power of the *Texas*' 14-inch guns first hand. Of the experience he wrote:

Those of our troops who were not wax-gray with seasickness... were watching the *Texas* with looks of surprise and happiness. Under the steel helmets they looked like pikemen of the Middle Ages to whose aid in battle had suddenly come some strange and unbelievable monster.

There would be a flash like a blast furnace from the 14-inch guns of the *Texas* that would lick far out from the ship. Then the yellow-brown smoke would cloud and, with the smoke still rolling, the concussion and the report would hit us, jarring the men's helmets. It struck your near ear like a punch with a heavy, dry glove.

Then up on the green rise of a hill that now showed clearly as we moved in would spout two tall black fountains of earth and smoke.

"Look what they're doing to those Germans," I leaned forward to hear a G.I. say above the roar of the motor. "I guess there won't be a man alive there," he said happily.

That is the only thing I remember hearing a G.I. say all that morning.⁶⁶

⁶⁶ Ernest Hemingway, "Voyage to Victory," *Collier's Weekly*, July 22, 1944, accessed September 25, 2012. <http://www.unz.org/Pub/Colliers-1944jul22-00011>

Firing ceased at 0630, and the *Texas* stood by for call fire and any targets of opportunity. In the forty minutes which she spent shelling her targets, the *Texas* expended 155 armor piercing (AP) rounds and 117 high capacity (HC) rounds from her main battery and ninety-one HC rounds and ninety-nine common rounds from her 5-inch secondary battery. Two-hundred-fifty-five of her total 272 main battery rounds were fired on the 155mm gun positions at Pointe du Hoc. The other seventeen were fired on a fortified position. The secondary battery focused on enemy “pillbox anti-tank guns and machine guns.”⁶⁷ The action report remarks that based on reports by air aerial spotters the gunfire support from the *Texas* produced excellent neutralization results.⁶⁸

Spotting for the *Texas*' secondary battery was carried out by the ship's own fire control from the foretop. Spotting for the main battery was initially provided by pilots from the RAF, flying Spitfires. The action report states that:

Spotting by the Spitfire pilots was generally excellent and their often amusing comments were much enjoyed. They showed great keenness and efficiency in locating targets of opportunity although the zeal of one pilot nearly proved fatal. His strafing of an enemy command car cost him some flak damage to his plane and necessitated his quick return to his home base.⁶⁹

Once available, SFCP spotting was said to be “satisfactory when used” and that “communication was generally good.”⁷⁰ There were, however, problems with visual communication between the SFCP and the Rangers at Pointe du Hoc, which the action report claims was costly to the Rangers. The Rangers landed forty-five minutes late, which gave the Germans time to recover from the initial bombing and put up a very strong resistance. In his action report for the invasion, Captain Baker of the *Texas* remarked that had they, or one of the

⁶⁷ “Chronological Narrative of Operations of U.S.S. *Texas* for period 3 June 1944-17 June 1944;” Record Group 38: National Archives at College Park, College Park, MD.

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ Ibid.

destroyers, known that the Rangers landing at Pointe du Hoc were so delayed, they could have continued to provide covering fire in that period to prevent the German troops from regrouping.

The *Texas* remained in the Channel off Normandy until 17 June with the exception of the period of 9-11 June when she returned to Plymouth to replenish ammunition. During this time she supported the Rangers at Pointe du Hoc, resupplying the men on shore and acting as a hospital, providing medical care, and even surgery to wounded Rangers. She also took on twenty-seven prisoners of war. During the period of 6-17 June, the *Texas* turned her main battery on roughly two dozen targets, expending 442 14” MK 19 HC shells, 248 14” MK20-1 AP shells, 99 5” common shells and 173 5” HC shells.⁷¹

Later action off of the French coast at Cherbourg challenged the *Texas*. On 25 June she was tasked with bombarding coastal defenses in the Cherbourg area and providing gunfire support while the US Seventh Corps attacked the port from inland.⁷² Specifically the *Texas* was ordered to bombard the following pinpoint targets:

1. 155mm Battery (6 guns), casemated, at Grid 391275 on Pointe du Barfleur.
2. 150mm Battery (4 guns), Grid 304273.
3. 105mm Battery (2 guns), Grid 320291.
4. 105mm Battery (4 guns), Grid 205218.
5. Targets of opportunity.⁷³

However, due to late changes in H-hour times, and the uncertainty of locations, plans were changed and all prearranged fire was cancelled. Fire would only be delivered at the request of the Army or to return fire from coastal batteries.⁷⁴

⁷¹ “Chronological Narrative of Operations of U.S.S. *Texas* for period 3 June 1944-17 June 1944;” Record Group 38, National Archives at College Park, College Park, MD.

⁷² Action Report - Report of Bombardment of Cherbourg, 26 June 1944, written by the Commanding Officer, USS *Texas*, Captain Charles Baker; Records Relating to Naval Activity During World War II; WWII Action and Operational Reports; Records of the Office of the Chief of Naval Operations, Record Group 38: National Archives at College Park, College Park, MD.

⁷³ Ibid.

⁷⁴ Ibid.

Reaching the fire support area by 0950 and finding the initial targets already destroyed, the *Texas* and *Arkansas*, screened by destroyers, maneuvered in the area, awaiting orders to fire. At 1229 the bombardment group came under fire from coastal batteries. Shells splashed down around the ships, but the fire was concentrated on the *Texas*. With a spotter plane in the air, the destroyers laid a smoke screen which reduced the accuracy of the enemy fire. By 1244 the *Texas* began to fire on targets, and within less than ten minutes enemy gunfire was decreased. At 1314 the *Texas* ran through the smoke screen, invoking another round from the coastal defenses, and although the *Texas* took evasive action, the coastal batteries scored a direct hit on the conning tower at 1316. Damage was severe, but it was not a lethal hit and the *Texas* stayed in the action.⁷⁵ Ordered to increase their range to 18,000 yards, the *Texas* and *Arkansas* moved out and continued to fire on the shore batteries from that increased range, coming under heavy crossfire again until they were ordered to retire at 1500. Returning to Portsmouth, the *Texas* had expended 206 rounds of 14-inch shells. At 1447 Central Station reported to the conning tower on the *Texas* that an unexploded shell had been found in the forward section of the ship. In an officer's room between frames eighteen and nineteen, the 240mm HC shell had amazingly not detonated.⁷⁶

Spotting for the action off of Cherbourg was a mix of SFCP, spotter planes, and the ship's own directors due to the chaotic nature of the action. One round of six HC shells was determined a miss, and the action report claims that the "plane was in error as to map

⁷⁵ As previously mentioned, the damage to the *Texas* was as follows: The top of Director Three was sheared off, dropping it onto the Fire Control Tower. It then exploded against the longitudinal frame of the foremast. This explosion resulted in an upwards blast, which sheared off floor plates in the Navigation Bridge and rendered "steering gear, compasses, engine room telegraph, engine revolution indicator, I.C. circuits, electric cables and voice tubes" severed and useless. The hit resulted in eleven casualties, including one killed.

⁷⁶ Action Report: Bombardment of Cherbourg, 26 June 1944; Record Group 38, National Archives at College Park, College Park, MD.

reference....”⁷⁷ Further details on spotting for this engagement are vague in the action reports, and it is not made clear whether the planes were the ship’s own or provided by Allied air forces.

After undergoing repairs to the ship from damage sustained off of Cherbourg, the *Texas* sailed to the Mediterranean to cover the invasion of southern France. Following that invasion, the *Texas* returned to New York, where she underwent an overhaul in the fall of 1944. After her overhaul and a brief shakedown, she sailed for the western Pacific. A veteran of three amphibious landings, the *Texas* added to her experience in providing naval gunfire support by covering the landings on Iwo Jima and Okinawa. When peace was finally secured in August of 1945, the *Texas* had bombarded the shores of northern and southern France, North Africa, Iwo Jima and Okinawa. She had expended over 9,000 rounds from her main and secondary batteries, earned five Battle Stars, and helped revolutionize the use of battleships in the American Navy.⁷⁸

⁷⁷ Action Report: Bombardment of Cherbourg, 26 June 1944; Record Group 38, National Archives at College Park, College Park, MD.

⁷⁸ A complete list of ammunition expenditure is found in Appendix D.

11: Discussion of Naval Gunfire During the Invasion of France

After Allied forces secured the invasion beaches in northern France and began to fight their way eastward, there was not a great deal of thought or discussion given to the naval bombardment of the landings. Samuel Eliot Morison remarks in his volume covering the invasion that neither the Army nor the Navy made any attempts to check the results of the bombardment.⁷⁹ Adrian Lewis explains that the short bombardment period allowed for Normandy was a result of Army planners' belief in the element of surprise and lack of appreciation of naval gunfire. At both Sicily and Salerno, the Army ignored the recommendations of Admiral H. Kent Hewitt, USN, who took on the task of adapting the doctrine of the Marine Corps to the European and Mediterranean theaters. Hewitt attempted "to change the Army's concept for the amphibious assaults," especially concerning naval gunfire support.⁸⁰ Hewitt was not successful in his attempt, and despite the complaints of naval officers involved in the Normandy invasion, the Army continued to not utilize naval gunfire to its full potential.

Admiral Kirk claimed that the "First Army became so enamored of naval gunfire support that he had to warn General Bradley not to overdo it; the naval guns were being worn out...."⁸¹ Morison describes how many men who landed on the beach praised the effort of the naval bombardment. After inspecting defenses at Omaha, Colonel S.B. Mason, chief of staff of the First Infantry Division, wrote to Rear Admiral Hall that he was "firmly convinced that our supporting naval fire got us in; that without that gunfire we positively could not have crossed the

⁷⁹ Samuel Eliot Morison, *History of United States Naval Operations in World War II*, vol.11, *The Invasion of France and Germany 1944-1945* (Urbana and Chicago: University of Illinois Press, 1957), 168.

⁸⁰ Adrian Lewis, *Omaha Beach, A Flawed Victory* (Chapel Hill & London: The University of North Carolina Press, 2001), 79.

⁸¹ Morison, *The Invasion of France and Germany*, 168.

beaches.”⁸² And while there is an argument that not enough gunfire support was given on D-day, there one example which shows that the psychological effects of the naval gunfire support were invaluable. Morison and an October 1944 review of the amphibious operations during the Invasion of France quote a German military journal on the power of naval guns:

The fire curtain provided by the guns of the Navy so far proved to be one of the best trump cards of the Anglo-U.S. invasion Armies. It may be that the part played by the Fleet was more decisive than that of the air forces because its fire was better aimed and unlike the bomber formations it had not to confine itself to short bursts of fire.⁸³

Morison further emphasized the point of the psychological effect of heavy naval gunfire on enemy forces by quoting several German military leaders, as well as Adolf Hitler on the impact of the naval bombardment, and specifically to the Germans, the impact of the presence and firepower of the battleships:⁸⁴

Generalfeldmarschall von Rundstedt: “Besides the interference of the Air Forces, the fire of your battleships was a main factor in hampering our counterattacks. This was a big surprise, both in its range and effect.”

General Blumentritt “remarked that Allied Army officers who interrogated him after the war did not seem to realize the serious effect naval gunfire had on the German defenses.”

Generalfeldmarschall Rommel on 10 June: “Our operation in Normandy are tremendously hampered, and in some places even rendered impossible, by the following factors: (a) The immensely powerful, at time overwhelming, superiority of the enemy air force. . . (b) The effect of the heavy naval guns. Up to 640 guns have been used. The effect is so immense that no operation of any kind is possible in the area commanded by this rapid-fire artillery, either by infantry or tanks.”

Adolf Hitler: “. . . in his directive of 29 June, ‘made it clear that he regarded the destruction of the enemy’s battleships as of outstanding importance.’”

Despite all of the praise for Allied naval bombardment on D-day by both Allied and

German military, the October 1944 review of the amphibious operations is critical of the

⁸² Morison, *The Invasion of France and Germany*, 149.

⁸³ Morison, *The Invasion of France and Germany*, 168.

⁸⁴ Morison, *The Invasion of France and Germany*, 169.

bombardment. The overall recommendation set out in this document is that a longer period of bombardment is necessary to reduce defenses on beaches. The commander of the Western Task Force even recommended that Army officers should be given a better understanding of the “dependability and accuracy of naval fire.”⁸⁵ The commander of Assault Force “O” points out one of the biggest needs in regards to naval bombardment: an establishment of some type of measurement of the necessary amount of gunfire required to neutralize targets. For example, on Omaha beach, where 98,000 were landing, a total weight of rounds expended during the assault was 1,295.8 tons.⁸⁶ On Kwajalein Island, where assault troops numbered 22,000, 3,964 tons of projectiles were fired onto the landing beaches, and casualties were much lower.⁸⁷ This analysis also gives ratios for the two landings: troops landed, Omaha versus Kwajalein was 4:1; defensive strength of assaulted positions approximately 3:1; naval gunfire support was 1:3. It is further noted that no magical mathematical equation existed for figuring the amount of naval gunfire support necessary, but the above mentioned ratios showed the possibility that increased bombardment could have resulted in fewer casualties, and possibly, a shorter period of time required to secure the beaches.

⁸⁵ “Amphibious Operations, Invasion of Northern France, Western Task Force, June 1944;” United States Fleet, Headquarters of the Commander In Chief, Navy Department, 21 October 1944; Historical Amphibious File; Gray Research Center, United States Marine Corps Research Library; Quantico, Virginia.

⁸⁶ Ibid.

⁸⁷ Ibid.

12: Conclusion

After the Operation Neptune, the *Texas* participated in the invasion of southern France (Operation Dragoon). After a brief overhaul and shakedown cruise, the *Texas* made her way to the Pacific via the Panama Canal and Hawaii. By January of 1945 her decks were laden with anti-aircraft guns for defense against Japanese aircraft, and the experienced crew was prepared to provide gunfire support for Marine landings at Iwo Jima and Okinawa.⁸⁸ By the invasion of France, doctrine for naval gunfire support for amphibious landings had been standardized for the navy. The *Texas* covered the Pacific landings in the same way it had covered the beaches of Normandy. When the war ended in August of 1945, the *Texas* was in the Philippines. By that time, she had fired over four-thousand 14-inch shells in support of amphibious landings. Not once were those guns trained on another ship.

From September through December of 1945, the *Texas* participated in the return of troops to the United States in an operation known as MAGIC CARPET. Returning from the Pacific in October, the *Texas* carried home troops from Okinawa. Four MAGIC CARPET trips between Hawaii and ports in California were completed by the end of December, by which time the *Texas* had returned over four-thousand troops to America. Deactivation of the *Texas* began in December, and the *Texas* was sent to the Norfolk Navy Yard in Virginia. Assigned to the reserve fleet in June of 1946, she remained up at Hawkins Point, Baltimore, until March of 1948. After lobbying from Texas state officials and citizens, the United States Navy agreed to give the ship to the state of Texas where she could be preserved at the San Jacinto Battlegrounds, outside of Houston. The *Texas* was decommissioned on April 21, 1948, after forty-four years of service and handed over to the Battleship Texas Commission, to be preserved as the first permanent

⁸⁸ See Appendix E. for armament totals.

museum ship in the United States, as a lasting memorial to the United States Navy in both World Wars.

American battleships entered the war in the role for which they had been designed: to fight great ship to ship engagements at sea. War Plan Orange had called for a decisive fleet action, but that fleet action evolved into carrier, not battleship, action. War Plan Orange also called for the buildup of bases in the Pacific, and with the Japanese in possession of many strategically important islands, those islands had to be taken by force. Landing forces needed protection during invasions, and this provided a need which the oldest ships of the fleet, *Arkansas*, *New York*, *Texas* and *Nevada* could fill. The US Navy and Marines used every engagement to improve on doctrine. In just two years the weak naval gunfire doctrine of 1942 was developed into a detailed and efficient doctrine.

Speed and shorter firing ranges were irrelevant when shelling an enemy beach. Most of the handicaps that made America's old battleships obsolescent in comparison with its newest ships were irrelevant when facing a fortified enemy beach. The ability of the American forces to repurpose its resources and look past traditional roles for ships such as the *Texas* proved instrumental to American victory in the Second World War.

Bibliography

Primary Sources

National Archives at College Park, College Park, Maryland

“Allied Naval Assault Gunnery Instructions, 1944.” History and Museums Division; Subject File Relating to World War II; Records of the U.S. Marine Corps, Record Group 127; Box 33, Folder 5.

Baker, Captain Charles, USN. “Chronological Narrative of Operations of U.S.S. *Texas* for period 3 June 1944 – 17 June 1944;” Records Relating to Naval Activity During World War II; WWII Action and Operational Reports; Records of the Office of the Chief of Naval Operations, Record Group 38; Box 1470.

Baker, Captain Charles, USN. “Action Report – Report of Bombardment of Cherbourg, 26 June 1944;” Records Relating to Naval Activity During World War II; WWII Action and Operational Reports; Records of the Office of the Chief of Naval Operations, Record Group 38; Box 1470.

“Battleships, Battle Force, U.S. Fleet Bulletin of Tactical Information 1938;” Registered Publications Section; U.S. Navy Technical Publications, 1901-1960; Records of the Office of the Chief of Naval Operations, Record Group 38; Box 126, Folder 3.

Commanding General, Headquarters, Amphibious Corps, Pacific Fleet at Camp Elliot, California to Chief of Naval Operations, September 2, 1942; History and Museums Division; Subject File Relating to World War II; Records of the U.S. Marine Corps, Record Group 127; Box 33, Folder 5.

“Corps General Order 6-43: Naval Gunfire Support in Landing Operations.” History and Museums Division; Subject File Relating to World War II; Records of the U.S. Marine Corps, Record Group 127; Box 33, Folder 5.

Director, Fleet Maintenance Division, to Chief of Naval Operations, November 8, 1939; Strategic Plans Division Records; Subject Files, 1937-1941 (Series V); Records of the Office of the Chief of Naval Operations, Record Group 38; Box 95, Folder “BB – Battleships.”

Director, Fleet Maintenance Division, to Chief of Naval Operations, November 15, 1939; Strategic Plans Division Records; Subject Files, 1937-1941 (Series V); Records of the Office of the Chief of Naval Operations, Record Group 38; Box 95, Folder “BB – Battleships.”

Henderson, Major Frederick P. History and Museums Division; Subject File Relating to World War II; Records of the U.S. Marine Corps, Record Group 127; Box 33, Folder 5.

Lammers, Commander H.M., USN. "Naval Gunfire in Support of a Landing." March 2, 1928; Strategic Plans Division Records; Lectures and Speeches (Series I); Records of the Office of the Chief of Naval Operations, Record Group 38; Box 8.

Map: Neptune Initial Bombarding Positions; Miscellaneous; U.S. Naval Forces Europe, Historical Section, Records Re; Operations Overlord and Neptune, 1942-1945; Records of the Naval Operating Forces, Record Group 313; Box 3, Folder 7.

"Operation Neptune – Naval Operation Orders." Commander, Eleventh Amphibious Force; Operations Plans and Orders and Other Records Relating to Operation NEPTUNE, 1943-1944; Records of the Naval Operating Forces, Record Group 313; Box 3.

Marine Corps Archives - Alfred M. Gray Marine Corps Research Center, Quantico, Virginia

"Amphibious Operations, Invasion of Northern France, Western Task Force, June 1944." United States Fleet, Headquarters of the Commander In Chief, Navy Department, 21 October 1944; Historical Amphibious File; Box 12, Folder 252.

"A History of U.S. Fleet Landing Exercises" by B.W. Bally, Lt. Col., USMC; "Gunfire Support in Fleet Landing Exercises" by David L. Nutter, Lt. Com., US Navy; "Landing Operations and Equipment" by William F. Royall, Lt., US Navy; "Pictorial Record of Landing Boat Development" by William F. Royall, Lt., US Navy. Historical Amphibious File; Box 2, Folder 73.

Secondary Sources

Books

- Egan, Robert S., Arnold S. Lott, LCDR, USN (Ret.), and Robert F. Sumrall, HTC, USNR. *Ship's Data 6, USS TEXAS (BB35)*. Annapolis: Leeward Publications, Inc., 1976.
- Friedman, Norman. *U.S. Battleships: An Illustrated Design History*. Annapolis: United States Naval Institute, 1984.
- Mahan, Alfred Thayer. *The Influence of Sea Power Upon History, 1660-1783*. New York: Barnes & Noble, Inc., 2004.
- McBride, William M. *Technological Change and the United States Navy, 1865-1945*. Baltimore & London: The Johns Hopkins University Press, 2000.
- Miller, Edward. *War Plan Orange, The U.S. Strategy to Defeat Japan, 1897-1945*. Annapolis: Naval Institute Press, 1991.
- Millett, Allan R., and Peter Maslowski. *For the Common Defense*. New York: The Free Press, 1984.
- Morison, Samuel Eliot. *The Battle of the Atlantic*, Vol. 1 of *History of United States Naval Operations in World War II*. Urbana and Chicago: University of Illinois Press, 1947.
- *The Struggle for Guadalcanal*, Vol. 5 of *History of United States Naval Operations in World War II*. Urbana and Chicago: University of Illinois Press, 1949.
- *The Invasion of France and Germany, 1944-1945*, Vol. 11 of *History of United States Naval Operations in World War II*. Urbana and Chicago: University of Illinois Press, 1957.
- *Leyte, June 1944 – January 1945*, Vol. 12 of *History of United States Naval Operations in World War II*. Urbana and Chicago: University of Illinois Press, 1958.
- Nofi, Albert. *To Train the Fleet for War, The U.S. Navy Fleet Problems, 1923-1940*. Newport: Naval War College Press, 2010.
- Sprout, Harold and Margaret. *Toward a New Order of Sea Power, American Naval Policy and the World Scene, 1918-1922*. Princeton: Princeton University Press, 1940.

Magazines

Ernest Hemingway, "Voyage to Victory," *Collier's Weekly*, July 22, 1944.
<http://www.unz.org/Pub/Colliers-1944jul22-00011> (accessed September 25, 2012).

Websites

I Biblio, The Public's Library and Digital Archive. "Conference on the Limitation of Armament," http://www.ibiblio.org/pha/pre-war/1922/nav_lim.html (accessed December 1, 2011).

Naval History and Heritage Command. "The Great White Fleet,"
<http://www.history.navy.mil/faqs/faq42-1.htm> (accessed September 21, 2012).

NavSource Naval History, Photographic History of the U.S. Navy. Accessed October 23, 2012.
<http://www.navsource.org/archives/01/35e.htm>

United States Marine Corps Biographies. "Brigadier General Fred P. Henderson – Deceased,"
https://slsp.manpower.usmc.mil/gosa/biographies/rptBiography.asp?PERSON_ID=992&PERSON_TYPE=General (accessed October 10, 2012).

Appendix A

5

Support Control

35. Fire Support Groups/Bombarding Forces should be allocated to Assault Force Commanders prior to an amphibious operation. The Task Force Commander or Commander-in-Chief may retain a Reserve Force at his disposal if required.

36. During an amphibious operation the control of naval fire support should be exercised from Assault Force Headquarters in a Headquarters Ship, from the flagship of the Fire Support Group/Bombarding Force or from Headquarters ashore.

D Day Requirements

37. All types of fire support tasks are likely to feature amongst the D day requirements which are best considered in the three phases shown below :—

Phase.	Landing Force Activity.	Type of Support Required.	Priority Targets.	Observation.
I.	Approach.	Counter battery. Deep support.	Batteries. Major defences. Reserves.	Air. Ship.
II.	Assault.	Close support. Counter battery.	Beach defences. Batteries.	Ship. Air.
III.	Advance.	Close support. Deep support. Counter battery.	Opportunity targets. Strong points. Counter attacks. Batteries.	Shore. Air. Ship.

38. Phase I should begin just before or with the arrival of the Landing Ships (A.P.A. or L.S.I.) in the transport area/lowering position. Battleships, monitors and cruisers should deliver fire on prearranged and opportunity targets with their main batteries/armament using air and/or ship observation with the object of neutralizing enemy batteries and delaying movements of enemy reserves. This phase should end when it becomes necessary for particular supporting ships and craft to move inshore to deliver Close Support Fire on the beaches, but Counter Battery and Deep Support Fire should be continued throughout the landing by the battleships, monitors and cruisers main batteries/armament.

39. Phase II should begin at approximately H minus one hour with the movement inshore of particular cruisers, destroyers and support craft so timed that they reach their positions at approximately H minus 30 minutes. During this phase supporting ships and craft should deliver prearranged Close Support Fire on enemy beach defences using ship and/or air observation. This fire should be as heavy as possible and be continued until the last possible moment before H hour when it should be lifted further inland or shifted to the flanks of the landing beaches. The object during this phase is the neutralization of enemy defences on and in the vicinity of the landing beaches. This phase should end when observers are established ashore and ready to call for fire.

40. Phase III should begin at approximately H plus 30 minutes which is the estimated time by which observers should be established ashore with the infantry battalions and capable of calling for supporting fire. During this phase a cruiser or destroyer should normally support each assault battalion. Tasks may take the form of Counter Battery, Deep and Close Support Fire on opportunity targets indicated by shore or air observers. Phase III should continue for as long as possible but will be limited by the availability of warships and ammunition, and the effective range inland of naval gunfire.

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Appendix B

Ammunition Expended by the *Texas* during World War Two.

Main Battery (14-inch/45 caliber)

Port Lyautey, North Africa.....	273 rounds
Normandy.....	891 rounds
Southern France.....	172 rounds
Iwo Jima.....	923 rounds
Okinawa	2,019 rounds
	TOTAL 4,278 rounds

Secondary Battery (5-inch/51 caliber)

Port Lyautey, North Africa.....	6 rounds
Normandy.....	272 rounds
Southern France.....	0 rounds
Iwo Jima.....	967 rounds
Okinawa	2,640 rounds
	TOTAL 3,885 rounds

Antiaircraft Battery (3-inch/50 caliber)

Southern France.....	90 rounds
Iwo Jima.....	4 rounds
Okinawa	490 rounds
	TOTAL 584 rounds

Machine Gun Battery (40 millimeter)

Normandy.....	192 rounds
Southern France.....	429 rounds
Iwo Jima.....	3,100 rounds
	TOTAL 3,721 rounds

Machine Gun Battery (40 millimeter)

Okinawa.....	2,275 rounds
	TOTAL 2,275 rounds

This data was taken directly from Egan, Robert S., Arnold S. Lott, LCDR, USN (Ret.), and Robert F. Sumrall, HTC, USNR. *USS Texas (BB35)*, p. 47. Numbers may vary according to different sources.

Appendix C

USS *Texas* Armament Changes, 1914-1944.

Guns	Mounting	March 1914	Sept. 1917	Sept. 1927	Jan. 1941	Dec. 1941	June 1942	Aug. 1942	July 1943	Oct. 1944	Dec. 1944
14"/45 Mk. 3	Twin Mk. 12	10	10	10	10	10	10	10	10	10	10
5"/51 Mk. 13	Single Mk. 13	21	16	16	14	14	14	6	6	6	6
3"/50 Mk. 21	Single Mk. 13	-	8	-	-	-	-	-	-	-	-
3"/50 Mk. 21	Single Mk. 22	-	-	8	8	10	10	10	10	10	10
40mm Mk. 2	Quad Mk. 2	-	-	-	-	-	-	-	10	10	10
1.1" Mk. 1	Quad Mk. 2	-	-	-	4	4	4	8	-	-	-
20mm Mk. 10	Single Mk. 4	-	-	-	-	16	16	38	38	42	44
.50 cal	Single	-	-	-	8	-	-	-	-	-	-
21" Torpedo Tube Mk.3	Single, Submerged	4	4	-	-	-	-	-	-	-	-

From Egan, Robert S., Arnold S. Lott, LCDR, USN (Ret.), and Robert F. Sumrall, HTC, USNR.
USS Texas (BB35), p. 45.

Vita

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